APRIL | 50 CENTS

analog

SCIENCE FACT — SCIENCE FICTION

"WHAT'LL YOU GIVE?" BY WINSTON P. SANDERS

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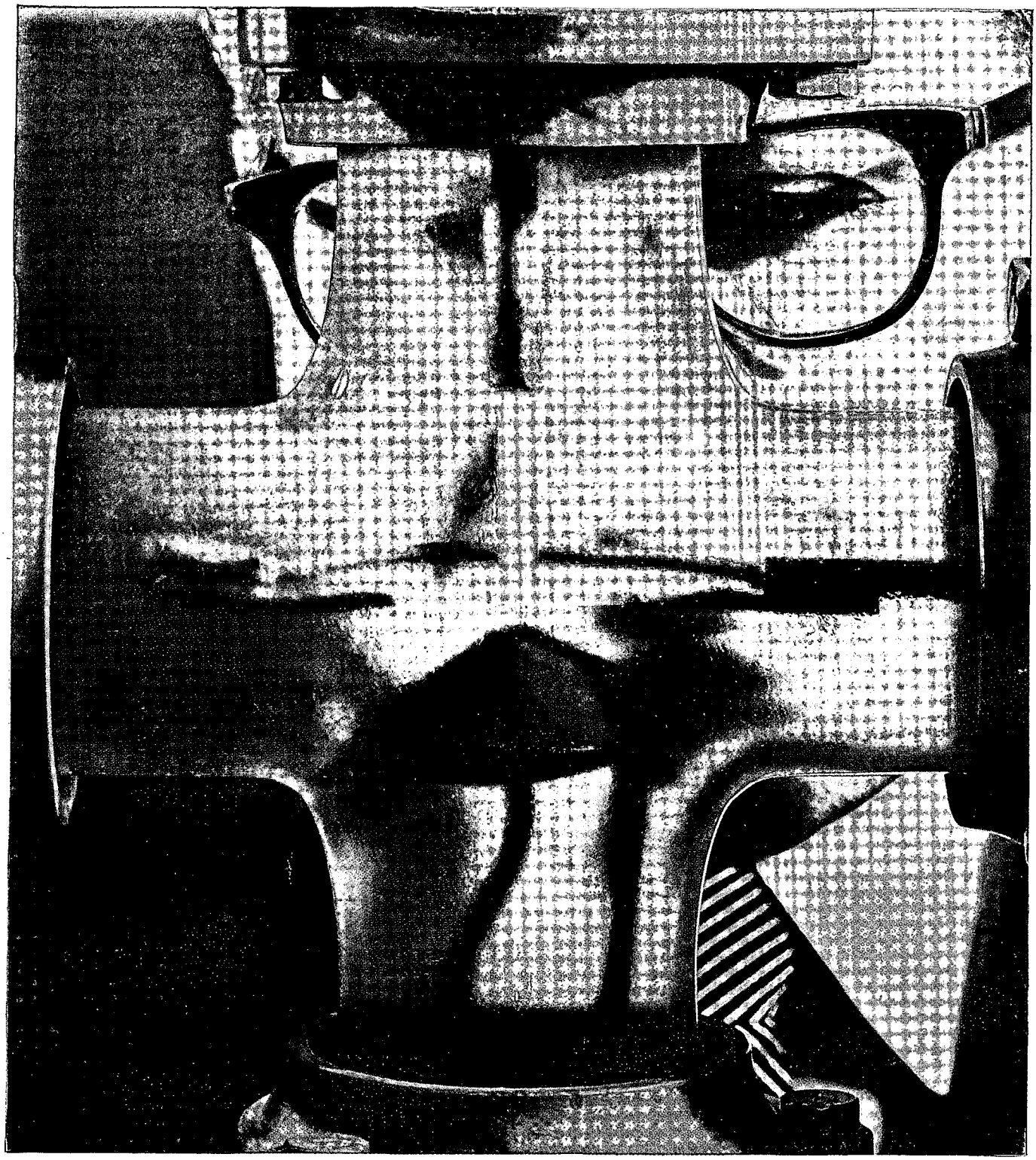

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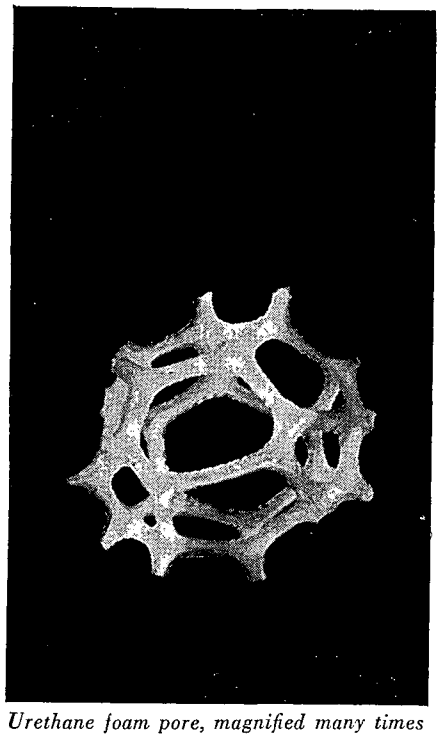
News from Allied Chemical:

A roundup of new developments which proves that, despite intervening "ages" of electronics, nucleonics and space, the Age of Plastics is still very much with us.



Urethane foam pore, magnified many times

What's with the urethanes today? Applications can now be numbered by the thousands. Some of the newer ones: lining for an astronaut's helmet, "shoes" for walking on water, marine finishes with double the life of spar varnish, sprays for reducing freeze-thaw cycles on concrete underpasses. In brief, urethanes are very much on the march, and Allied Chemical is a leading producer of basic urethane chemicals: Nacconate® Diisocyanates, Actol* Polyethers, and Genetron® Blowing Agents . . . and leader in the chemistry and commerce of urethane applications.

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SCIENCE FACT

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COVER BY JOHN SCHOENHERR

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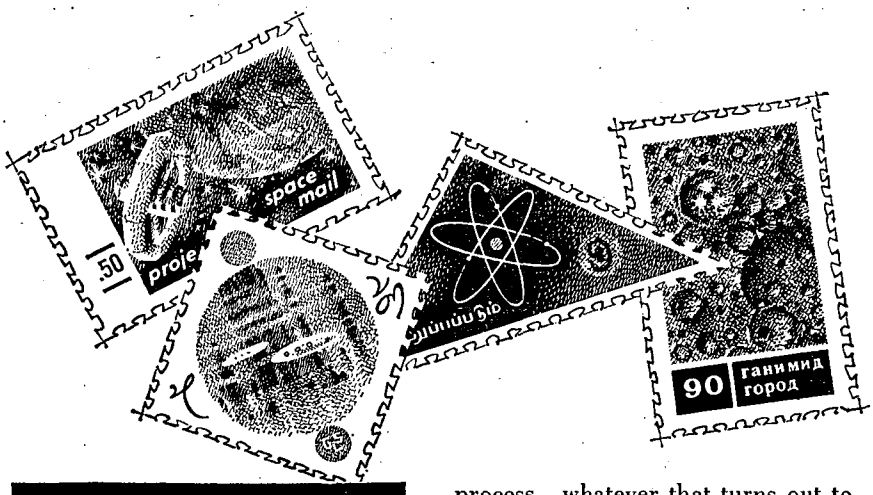

BRASS TACKS

Dear John:

One of the most interesting things about hypnosis—and many other phenomena dealing with human behavior—is the folklore that builds up around a given subject which becomes so entrenched it's often passed on as gospel truth even though it hasn't a shred of experimental evidence to back it up. Best guess now, as you know, is that Galileo DIDN'T drop those balls from the Leaning Tower. Likewise with the belief that if one dares to meddle with a neurotic's symptoms, to remove the symptoms with hypnotic suggestion—for example—another set of even more debilitating symptoms will crop up to plague the poor patient. Lovely idea, and it's one that is found extensively quoted in hypnotic and psychotherapeutic literature. Sadly enough, the theory of uselessness of symptom removal is just that—a theory not very well tested in the laboratory.

Before I am jumped upon by Joel Karin, who argued persuasively against symptom removal via hypnosis in the October issue, and by various other "experts" in the field, let me explain. If experimental studies have shown anything about the whole field of suggestion, it's this—attitudes, beliefs and opinions, be they conscious or unconscious, are crucial in the suggestion process—whatever that turns out to be. Thus if a hypnotist tries to remove a symptom from a patient, but the hypnotist suspects this will merely lead to the patient's coming up with a new and worse symptom. that's usually precisely what the poor patient will do. For the hypnotist, unwittingly, will have given precisely that sort of suggestion to the patient. Most of us make the mistake of assuming that only the hypnotist's WORDS, devoid of context, devoid of the patient's interpretations, devoid of the sincerity with which they are said, devoid of subtle coughs and sighs and intonations, in short that only the pure dictionary meaning of the words themselves is what the patient responds to. Instead, the patient—in one sense of the word—reads the hypnotist's unstated commands, challenges, hopes and aspirations and responds to these in large part instead of just responding to the words themselves.

Now, the more skeptical of your readers will demand data to prove my contentions. For one thing, see the results that Robert Rosenthal, late of the Department of Psychology at the University of North Dakota and now at the Department of Social Relations at Harvard, has been getting with his intriguing studies in this area—technically known as the field of "experimenter bias" in psychology. For another, look at the data coming from the continuing studies on juries from the University of Chicago Law School. There a sociologist has found that even when he used the most impartial of judges who did their best to hid their own opinions from the juries, the judges were unsuccessful in hiding their opinions of the cases being tried from the juries.

On the other hand, there's little to be said for the data which tend to indicate that symptoms crop up in another form if banished in their present guise. True? Freud did some work in the area—more than sixty years ago, under unknown conditions, and on a total population of four hysterics. The only seemingly well controlled studies in this area are being performed by a British psychologist-psychiatrist team—their names escape me, but their work was written up in *Time* last year—who apparently have shown that symptoms do NOT recur, even years afterwards, if the hypnotist himself believes they won't recur.

I think most people PREFER to believe the theory of symptom substitution—as it is usually called—since it jibes so nicely with the notion that symptoms—mental ones, that is—merely are indices of a deep, underlying psychological difficulty. Naturally, they argue, removing the symptom won't cure the underlying problem. I must remind your readers, though, that there is precious little proof that mental symptoms work like physical ones do, or that a given patient's problems may necessarily be of the "deep, underlying" variety. More than this—and this is important, John—in the case of mental illness, it's always the SYMPTOM that bothers us—and the patient—not the "deep, underlying mental disturbance." People don't get locked up because they're mentally ill, they get locked up because they behave badly. As I say in class, "the trouble with crazy people is that they act crazy." If we could cure ALL the patient's symptoms, we wouldn't have to worry overly about his underlying problems. Who knows, maybe the underlying problems—if indeed they exist at

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all outside of the therapist's theory —are caused by the symptoms?

If Joel Karin thinks that his nail-biting patients will become hysterics if, under hypnotherapy, Karin tells them to stop biting their nails, I'm willing to predict that his patients will most certainly become hysterics. However, this doesn't mean that Joe Smith's patients would do the same if Joe thought he could cure symptoms once and for all. I'm willing to bet the British doctors are right, that it's the hypnotist who's calling forth the new symptoms. In which case—as again I've often said—most therapists need to have their heads—i.e., their attitudes, beliefs and opinions —examined!"

JIM MCCONNELL

■ *Information on that subject is going to be harder to catch than a claustrophobic ghost!*

Dear John:

I read the September Analog with great interest, particularly Goodavage's article and your editorial on astrology.

Goodavage points up an interesting moment in history. Galileo, Kepler and Newton are generally credited with opening up the modern era not only of astronomy, but of physics as well. Galileo, in particular, is usually cited as the man who made physical science a quantitative study, and established it in the form in which it can make meaningful contributions to man's knowledge of the actual world.

Now and then, if these men believed as much in astrology as they did in physics, why was not astrology established in a similarly dignified role? The answer, I think, is that physics completely outclassed astrology in its ability to produce results—to make useful, quantitative predictions of the future. Galileo may have cast horoscopes for his children, but when he wanted to learn how fast a stone fell he measured the rate of fall. Newton derived the calculus and produced

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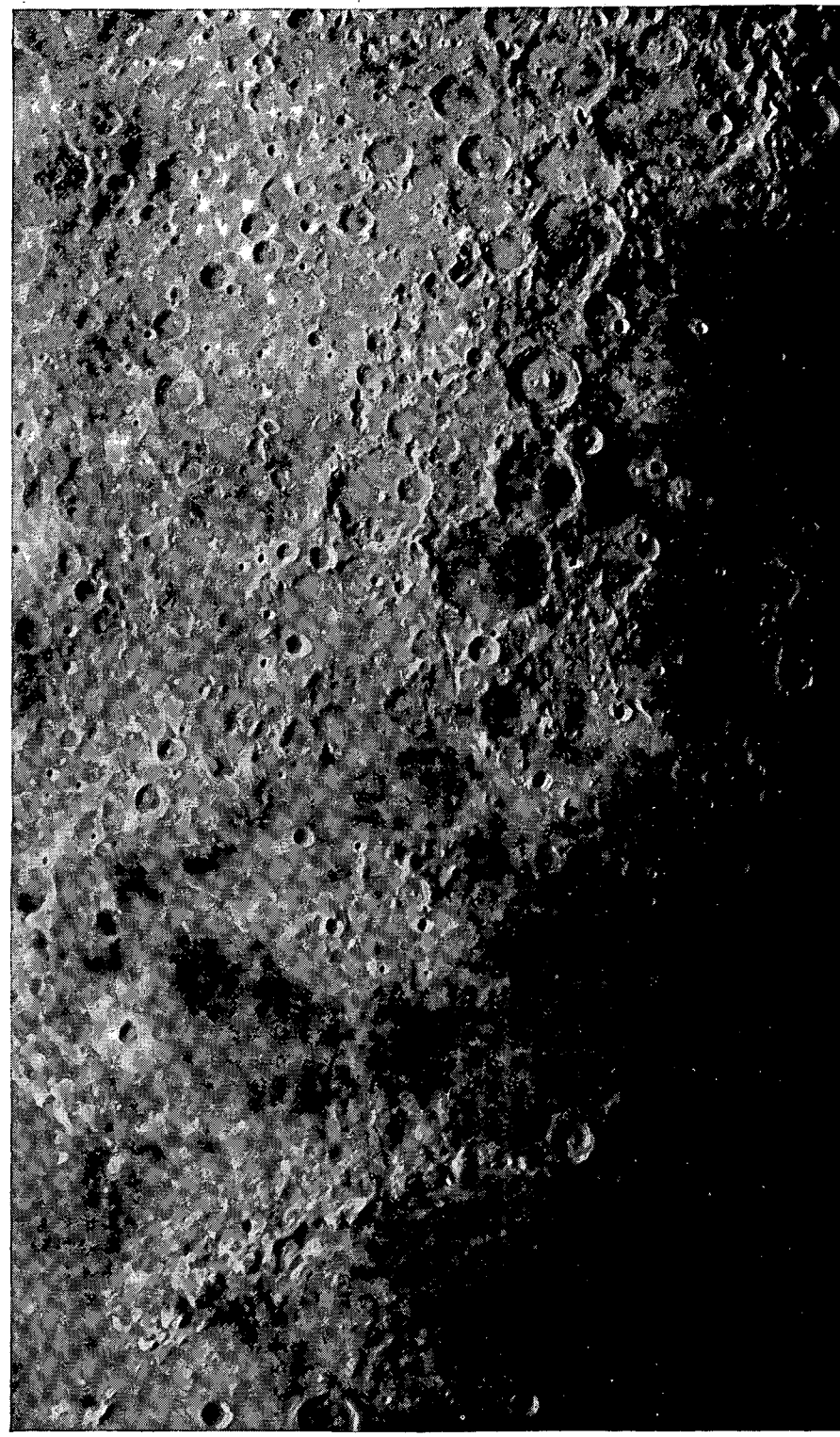

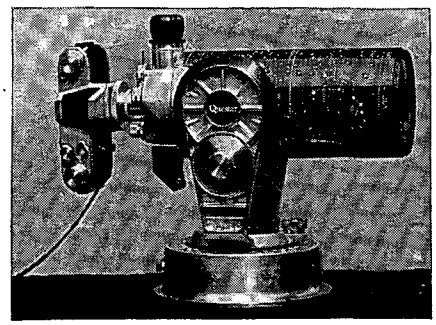

QUESTAR

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This picture of the moon is more than just remarkable, because no other telescope of only 3.5 inches aperture has been able to resolve more than about half the detail shown here. The photograph was made by a 7-pound Questar telescope on 35-mm. Microfile film using a focal length of 5800 mm. and FR X-22 developer. Exposure 10 seconds, with electric drive. Like all superb high-resolution negatives, this gossamer-thin emulsion holds much that defies enlargement. It took both skill and artistry to make this 12-inch print. And we were many years learning how to make Questar's optics some 16 times more accurate than any available commercially. We believe that no amount of money, time or human effort can improve those Questars we decide are fine enough to bear our name and leave our careful hands.

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EDITORIAL BY JOHN W. CAMPBELL

SOCIOLOGICAL BARRIER

This concerns a mystery—one of the greatest, and least noticed mysteries in the entire history of Mankind on Earth. It's a mystery of immense and very immediate importance to present world problems—and of major importance to all studies of anthropology, sociology—and to science-fictioneers, for that matter.

The mystery is easily stated: Why are the Negro peoples of Africa the only branch of the human race who never developed a high-level civilization of their own, nor learned one from their neighbors?

To discuss this mystery—and I mean exactly what I say; it is a mystery, to which I have no answer—it is first necessary to (1) establish that it exists, and (2) knock down a lot of phony "answers" and excuses.

First, that it exists: There has been a high-level culture in the Nile valley of Africa for six thousand years of record. During those six thousand years, the civilization of Egypt spread through the Cretans to the Greeks, to the Romans, and, by way of slavery and escape, to the Jews. The Romans passed it on to the Gauls, and during the following centuries, it penetrated the Franks, the Germans, the Norse, the British and Irish, and the Scots. It passed on to the east, partly via the Greek conquests, partly via the Moslem Empire, where it met the cultural influences of the Chinese centers of civilization.

Eventually, it crossed the Atlantic under Spanish Conquistadores to reach all the New World west to California and south to Tierra del Fuego.

But it didn't, in all that time, penetrate south of the Sahara in Africa!

When high-level culture did reach the African Negro peoples, it came *after* South America had been conquered, and then by way of the very remote descendants of the original Egyptian culture, the English . . . and it really got started in the extreme South of Africa.

Note that this is an absolutely unique-in-the-world record; in all the world, no other instance of a people living right next door to a high-level culture for thousands of years without learning from their neighbors occurred!

Talk about the Iron Curtain, and the Bamboo Curtain . . . ! Here was a sociological barrier so utterly impervious that *sixty centuries* didn't penetrate it in the slightest!

Cultural concepts that survive in New Guinea today, due to complete isolation from high-level cultures, also survive in Africa—which has been directly contiguous with a high-level cultural center through some three hundred human generations.

Not only that, but the Negro peoples never developed a high-level culture of their own during all that time, while dozens of other peoples did—even peoples completely isolated from each other, and from other cultural centers.

For instance, the Mayans, Incas and Aztecs developed high-level

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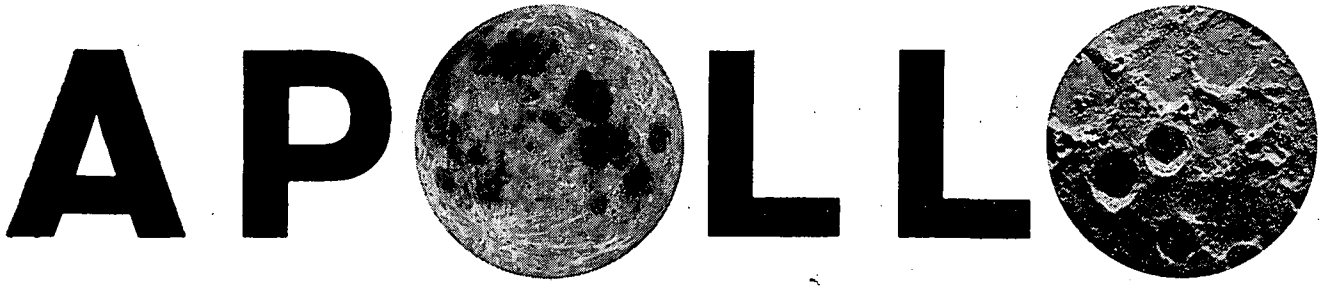
Systems Analysts
Programmers
Mathematicians

Men are planning to walk on the moon before this decade is over. And when a human sets foot for the first time on a celestial body other than earth, the consequences may be far more profound than Columbus' opening of the New World.



IBM has been assigned a crucial role in this vast undertaking—developing and programming the ground-based, real-time computer system for NASA's Project Gemini and the Apollo lunar program.

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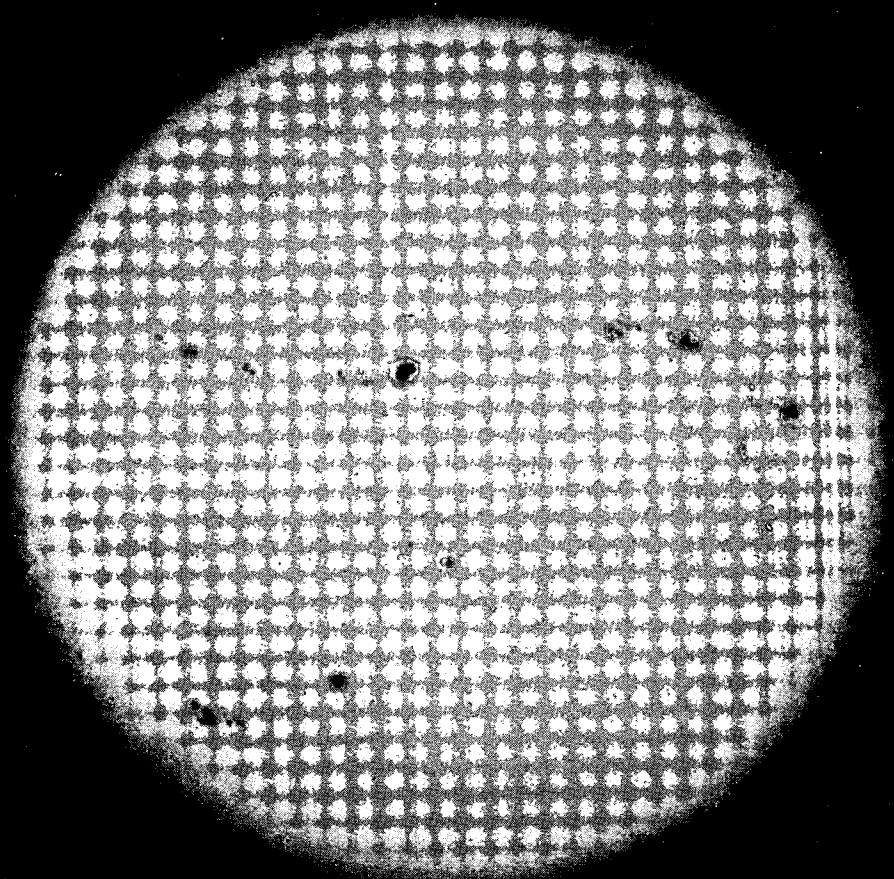

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WHICH STARS HAVE PLANETS?

One of the great problems of astrophysics
has been that of learning whether,
and if so which, other stars have planets.
Leinwoll suggests a fascinating,
and totally new approach to this problem.
By techniques now available,
using available instruments, we may be able
to spot other planetary systems,
and count the major planets!

by STANLEY LEINWOLL

Fig. 1: Recent photo of the sun, showing several sunspot groups strung across the solar surface.

Official U. S. Navy Photo

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A solid investigation of the discoveries of John Nelson, discussed in the September, 1962 edition of Analog, may provide the answers to some of the most stimulating and challenging questions of modern astronomy: Which stars in our galaxy have planetary systems of their own? Which of these are capable of supporting life?

At the present time it is not possible to detect the planets of other stars optically because planets which orbit even the nearest stars cannot be observed in the brilliance of the star's light. Under normal conditions it is similarly impossible to locate planets by their gravitational effects on the star around which they orbit, although there are exceptions, the most notable of these being the system of 61 Cygni. 61 Cygni is a binary star with a "dark star" companion, 61 Cygni C, which is too faint to be observed directly. The mass of this body, which has been determined from perturbations in the orbit of 61 Cygni, is about ten times the mass of Jupiter.

Evidently, if we are going to make a general determination of which other stars have planetary systems, an entirely new method of investigation is needed, and Mr. Nelson has given us the tools which might lead directly to a major breakthrough—a totally new approach to the exploration of stars and their planetary systems.

Mr. Nelson, who is Propagation Analyst for RCA Communications, Inc., predicts the occurrence of ionospheric storms, which adversely affect world-wide radio communications in the high-frequency bands, by observing the positions of the planets in relation to the sun. He has found that certain planetary configurations show a high degree of correlation with geomagnetic and ionospheric disturbances.

These storms, in turn, are triggered off by sunspots and solar flares, and Mr. Nelson has been forecasting these with an accuracy of well over ninety per cent.

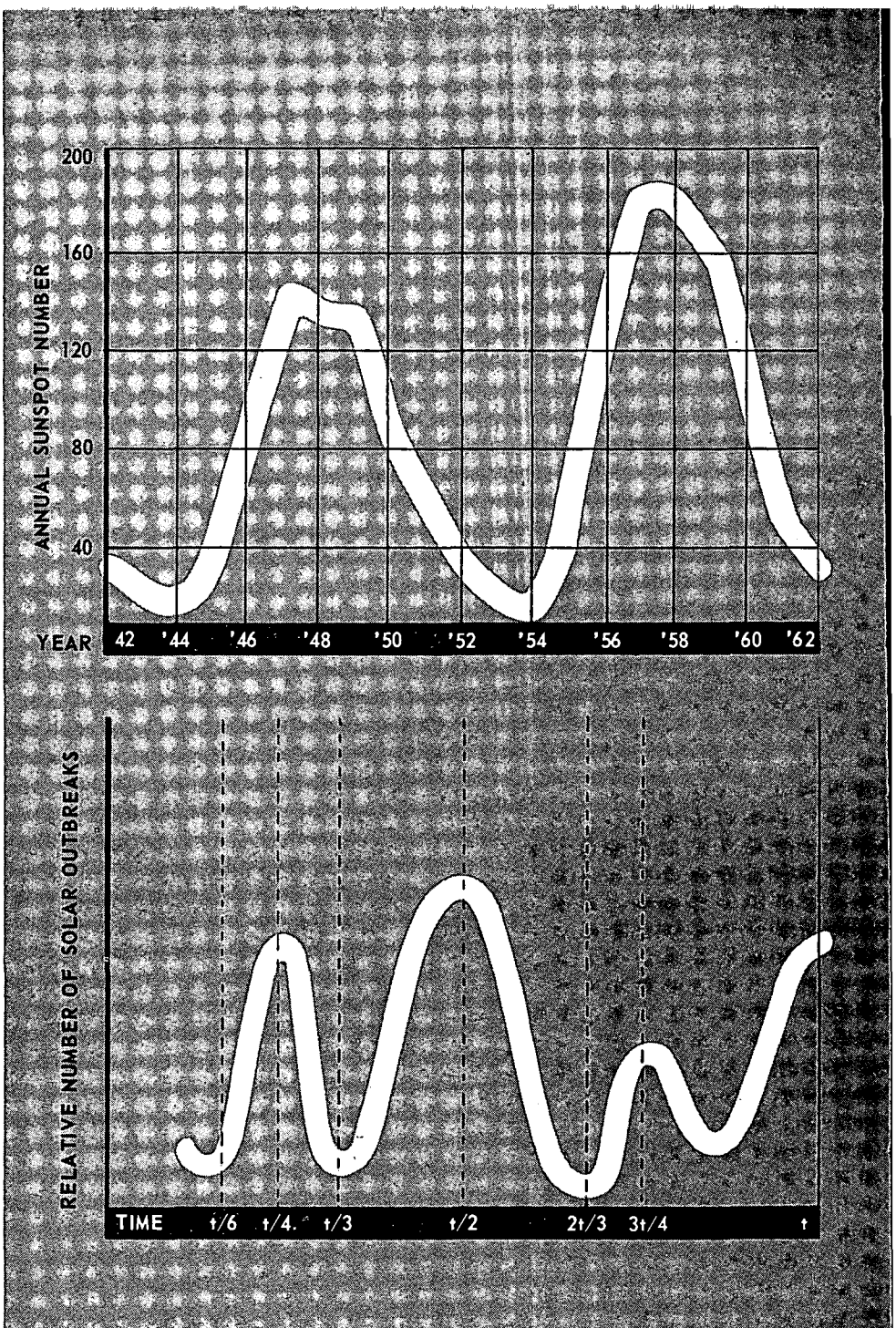

Fig. 2: Variation in annual sunspot numbers, 1942-1962.

Fig. 3: Curve showing hypothetical observations of disturbances plotted vs. time on a particular star.

Since few scientists now seriously believe that our solar system is unique in the universe, it is highly likely that the planets surrounding other stars in our own galaxy, as well as in other galaxies, affect their suns the same way in which the planets of our solar system affect the sun.

A method of investigating other star systems to determine whether they have planets of their own immediately suggests itself: If we can determine the nature of the phenomena which disturb and disrupt radio communications here on earth, we can study these and learn to recognize them. Then, by examining other stars—by observing any fluctuations of these phenomena, we might be able to determine whether a star has a planetary sys-

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tem, as well as some of the characteristics of this system.

Fortunately, a great deal has been learned in recent years about the solar phenomena which have a direct bearing on high-frequency radio transmissions.

The dates of the recent International Geophysical Year were chosen to correspond with a period of maximum sunspot activity so that the world's scientists and engineers could undertake an extensive program of solar research, including a detailed study of sunspots, solar flares, and the sunspot cycle itself.

SUNSPOTS

Sunspots are known to have been observed by the Chinese more than two thousand years ago. But it was not until 1612 that Galileo trained his newly invented telescope on the sun and actually observed in detail these dark areas on the solar surface. (See Fig. 1—p. 8)

Galileo concluded that sunspots occurred on the sun itself, rather than as a result of shadows being cast by objects located external to the sun.

By carefully studying the motions of these spots across the solar face, Galileo concluded that the sun rotates from east to west with a period of the order of twenty-seven days. Many of the sunspot maps and drawings that he made during the Seventeenth Century still exist, and compare favorably with maps currently being made with small modern telescopes.

Sunspots have been observed regularly since the middle of the Eighteenth Century, and the discovery of the sunspot cycle was made in 1843 by Hendrick Schwabe, a pharmacist who engaged in astronomy as a hobby.

By carefully observing the sun and making records of his observations over a period of twenty years, Schwabe noted that the number of sunspots varied over a fairly wide range and furthermore that the variations appeared to occur in a regular manner. He concluded that these variations were periodic, going from minimum, to maximum, to minimum again approximately every decade.

During the Eighteenth Century also, a Swiss astronomer, Rudolf Wolf, devised a standardized method of observing sunspots. His method takes into account the number of sunspot groups on the sun, as well as individual spots, according to the following equation:

$$R_n = k(10g + s)$$

where g is the number of groups visible on the sun, s the number of individual spots, R_n is the daily sunspot number, and k is a constant which adjusts for variations among observers and includes type and power of the telescope, visibility, location, et cetera.

The sunspot number is obtained daily by observatories throughout the world. These daily numbers are subject to wide fluctuations and are smoothed by first averaging them over a one-month period.

These monthly numbers are further smoothed by computing running averages for a year, which gives the average centered in the middle of the yearly period. By averaging two consecutive averages a final smoothed number is obtained. Numbers plotted over the past twenty years are shown in Fig. 2 (p. 10). Monthly sunspot numbers have been plotted back to 1755, and show an average periodicity of slightly under 11.1 years between minima.

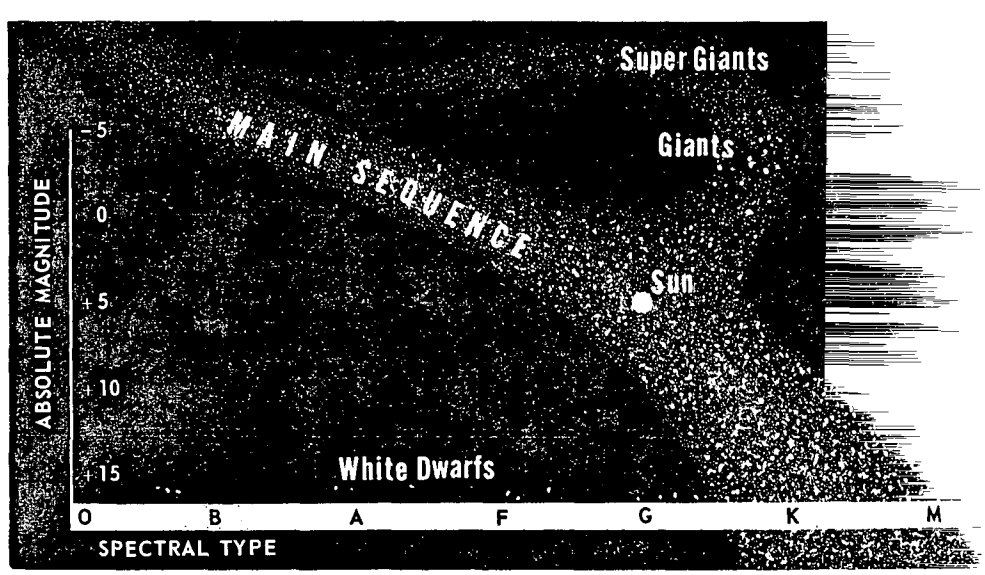
Sunspots appear dark because the temperature at their center can be as much as 1500° K less than at the surrounding photosphere, and the light given off by the cooler sunspot area is fifty per cent less intense than from the surrounding surface, making it darker by comparison.

Sunspots nearly always occur in groups, and vary considerably in size from clusters of tiny specks, each of which is about five hundred miles in diameter, to enormous groups which stretch hundreds of thousands of miles across the solar surface, and which contain individual spots up to 75,000 miles in diameter, an area into which nine planets the size of the earth could fit side by side!

Many solar phenomena are associated with sunspots, although the actual mechanics are not clearly understood at present.

One such phenomenon which produces important terrestrial ef-

Fig. 4: The main sequence, plot of luminosity vs. spectral type.



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Which Stars Have Planets?

fects—geomagnetic and ionospheric storms and accompanying radio communications blackouts—is the solar flare.

A solar flare usually is seen as a sudden brightening of the sun's surface near a sunspot or in a region of very recent sunspot activity. Flares are generally observable only in certain light, such as that of ionized hydrogen and calcium.

Flares, which are ejections of extremely hot and active solar material, are usually accompanied by intense radiation. When viewed in H-alpha, the red light of hydrogen, the flare reaches maximum brightness in a matter of minutes, during which a larger flare may expand to an area of hundreds of millions, up to a billion square miles. The decay of the flare is slower, and ranges from twenty minutes or so to several hours, depending on its size and the intensity of the eruption.

In addition to intense H-alpha radiation, significant enhancements occur in the Balmer and Lyman series regions far into the ultraviolet and X-ray portions of the spectrum below wavelengths of 100 Å

Terrestrial effects associated with flares occur in two stages. The first stage occurs almost simultaneously with the observation of the flare and results in a very severe but short-lived radio communications blackout throughout the daylight regions of the world. These sudden ionospheric disturbances (SID's) last from half an hour to several hours, after which conditions gradually return to normal. The SID is caused by solar X rays which are of sufficient hardness to penetrate to the lower regions of the ionosphere to cause the absorption necessary for a total high frequency radio communications blackout.

Twenty-four to thirty-six hours following the flare the high speed stream of solar material consisting principally of charged particles reaches the vicinity of the earth, causing severe geomagnetic and ionospheric storminess which may continue for several days and which further disrupts radio communications.

A record of radio noise bursts emitted by the sun as part of the IGY radio astronomy program has also yielded valuable data about solar flares. Sweep frequency monitoring observations in the High Frequency (3-30megacycles), Very High Frequency (30-300megacycles), and Ultra High Frequency (300-3000megacycles), regions of the radio spectrum, particularly in the range from 18-580 megacycles, has shown that the slow-drift solar noise burst is very closely associated with geophysical phenomena.

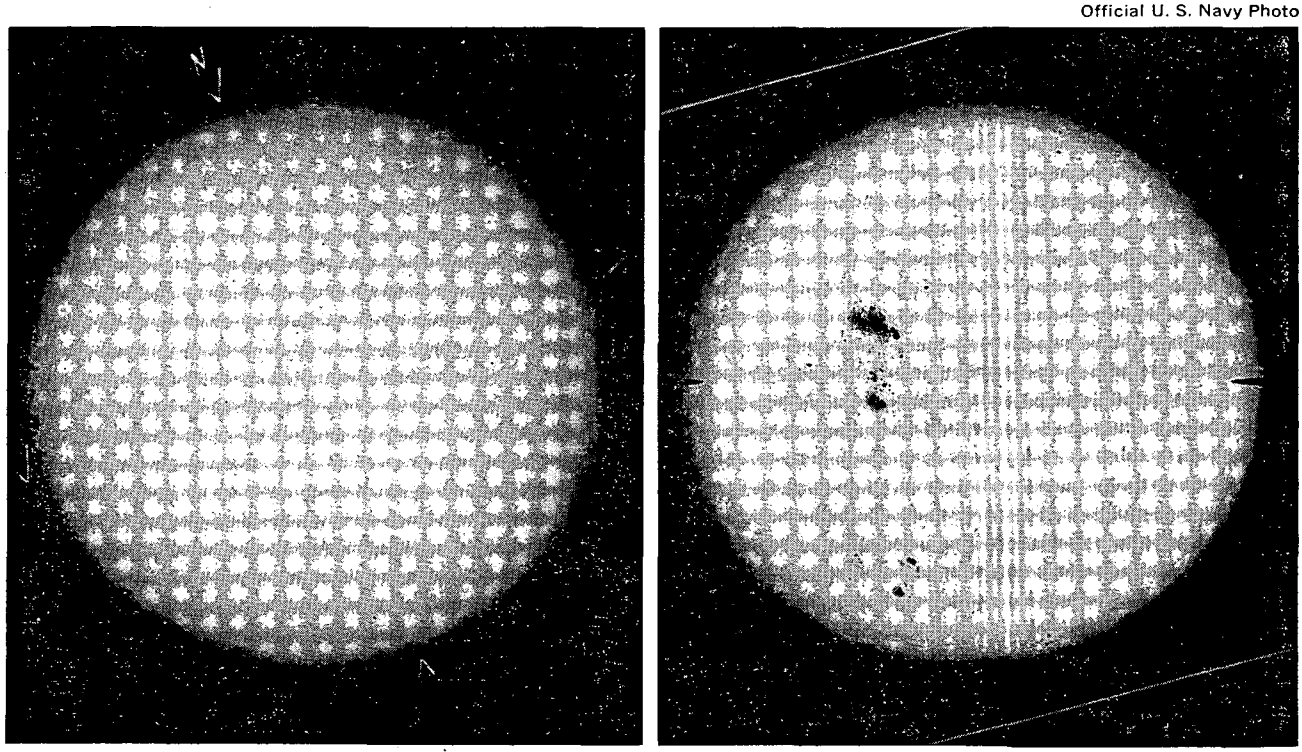
Slow drift bursts, which are often very intense, start with an outbreak at the upper end of the spectrum and then drift steadily downward toward the High Frequency part of the spectrum over a period of approximately five minutes.

Significant correlation exists between the observation of solar

Fig. 5: 1954 was a year of sunspot minimum; then, it appeared a blank shining disk.

Fig. 6: By 1958, sunspots were flaring toward maximum, with "holes" in the surface vast enough to swallow all the inner planets. The central darkest part of that largest one could swallow Earth and Venus side by side without trouble.

Official U. S. Navy Photo



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flares, slow drift bursts, and the subsequent occurrence of geomagnetic and ionospheric storms.

OTHER FLARE STARS

Our sun, then, is a flare star. But it is not unique. There are many other flare stars in the universe, and these exhibit characteristics almost identical, as far as has been determined, to those exhibited by our own sun.

These flare stars are observed principally among the red K and M stars on the main sequence, about which we will have more to say.

While the flare is in progress there is a bright continuous spectrum which veils part of the star's normal spectrum. A typical star on which such flare outbursts are frequently observed is the faint star of the binary Luyten 726-8 (UV-Ceti). One such flare resulted in an increased brightness of several magnitudes and continued for two minutes before starting to diminish.

Because of the spectral characteristics of blue and yellow stars, observation of flare activity on these based on brightness of their spectra alone would make detection unlikely.

Do these flare stars have planets? Mr. Nelson feels it is inconceivable for a star to show flare activity, and therefore have sunspots, without a plentary system to give rise to these phenomena.

Initially, then, our study to determine which other stars have planets could begin with the flare stars, preferably among the hotter red stars for reasons which we will discuss subsequently. An intensive program could be undertaken. We are aware of the characteristics which accompany disturbed conditions here on earth—the solar noise storms, the X ray bursts—and we can, therefore, determine the periodicity of flare activity by closely watching these, particularly in the H-alpha portion of the spectrum as part of the program. Once we have amassed a backlog of information we can go to work on specific details about the system of planets which orbit the star under study. We can do this by analyzing the disturbance data by means of the methods Mr. Nelson has used to correlate ionospheric disturbances with planetary configurations. Mr. Nelson's studies suggest the following deductions:

1. The most disturbed twelve-month periods are those which precede and follow configurations of 0°, 90°, 180°, and 270° between the most massive planets in the solar system, Saturn and Jupiter.

2. The most disturbed parts of the periods in (1) will be those in which Mars is close to an angle of 0°, 90°, 180°, or 270° with Jupiter or Saturn.

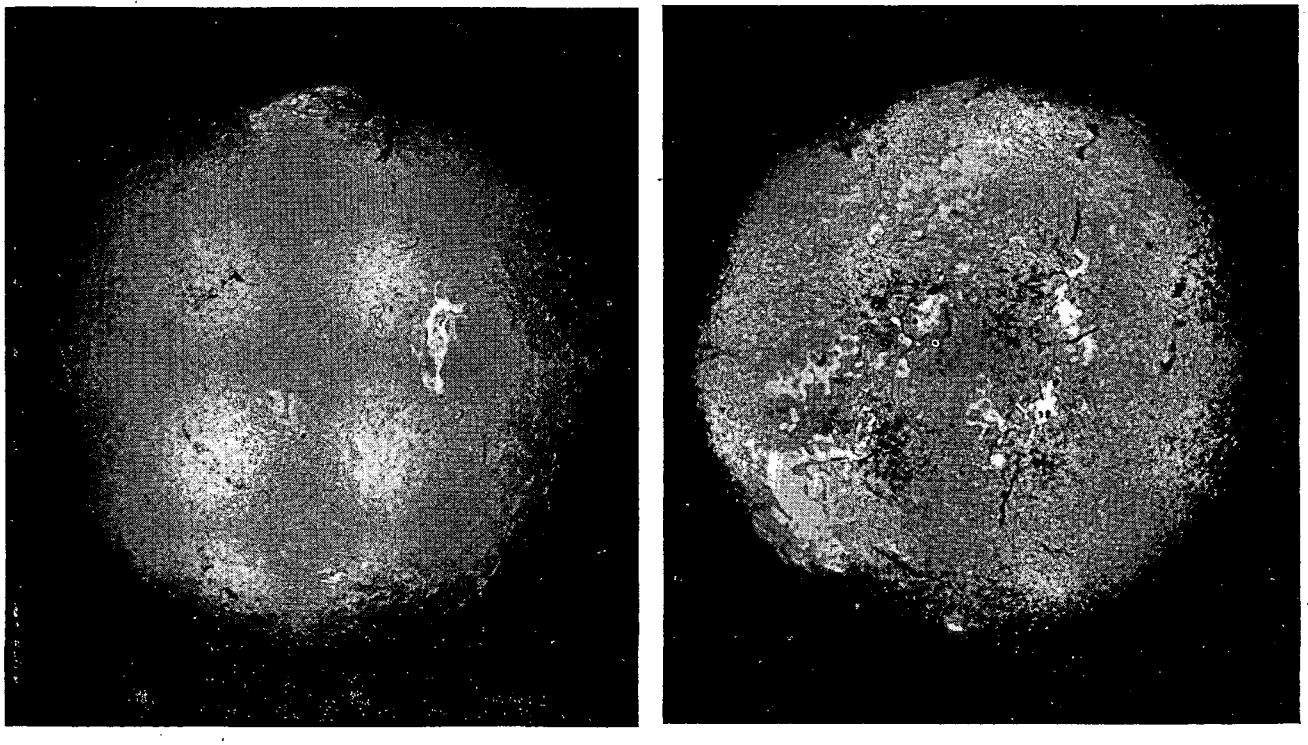
3. That the most disturbed parts of the periods in (2) will take place at times when the Earth, Venus, or Mercury make angles of 0°, 90°, 180°, or 270° with either Jupiter, Saturn, or Mars.

4. That the most severe disturbances of all will occur when the combined influence of Mars, the Earth, Venus, and Mercury are such that all four of these planets are arranged at angles that are multiples of 90° with Saturn and Jupiter while these are arranged in the configuration described in (1) above.

5. That the least disturbed peri-

Fig. 7 and 8: Taken in the light of the hydrogen-alpha line of the spectrum these shots show intense solar flares as brilliant areas on the generally dull-gray surface.

Sacramento Peak Observatory



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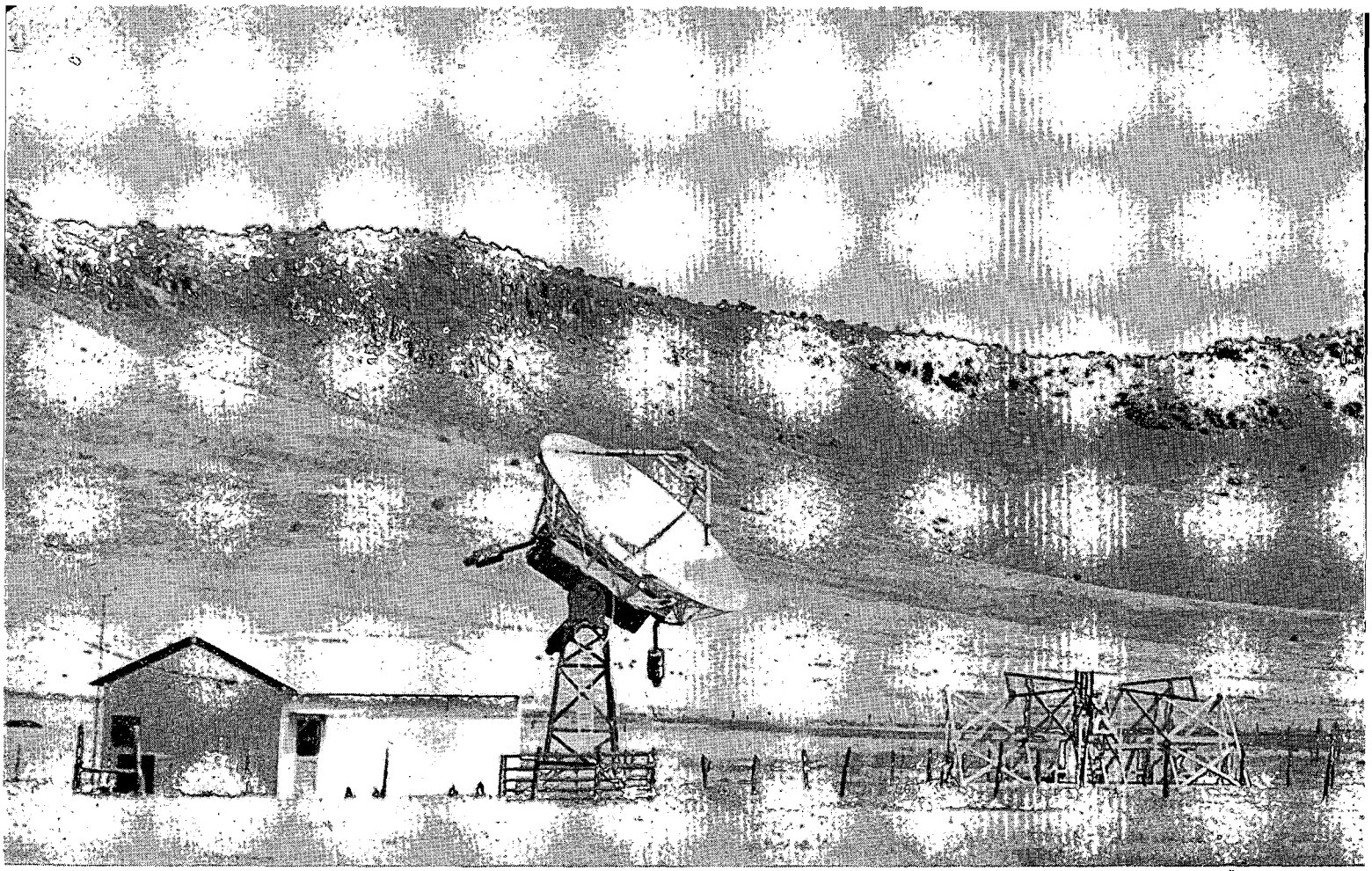

Which Stars Have Planets?

ods will occur when the two massive planets, Jupiter and Saturn, are arranged in trine, that is, separated by 120°. Disturbances occurring within these periods will be caused primarily by the inner planets, Mercury, Venus, the Earth, and Mars, making 0°, 90°, 180°, or 270° angles among themselves, or as part of a multiple configuration with either Jupiter or Saturn.

6. The least disturbed periods of all will be those in which Jupiter, Saturn, and Mars are spaced in trine, at 120° to each other. The principal disturbances during these periods will come from configurations at multiples of 90° which the Earth, Venus, and Mercury make among themselves or with either Jupiter, Saturn, or Mars. Multiple configurations involving five or six planets at one time are less frequent during periods when the relatively slow-moving outer planets are in trine.

7. 60° relationships, which are called sextiles in astrological parlance, are also beneficial and also tend to produce relatively undisturbed periods.

ANALYSIS OF FLARE STAR DATA

It is of course not possible at this point to predict what the data we obtain from our observations of flare stars will look like, although it is entirely valid to assume that a plot of disturbance events versus time will in all likelihood display some kind of cyclical behavior; this, in turn, could indicate the kind of periodicity which would result from planets orbiting and making different angles with each other, as suggested by Mr. Nelson's observations.

Depending on the characteristics of the curves obtained, and assuming that the angular relationships discovered by Mr. Nelson are invariant throughout the universe, we could determine a great deal of information about the planetary system of the star under study.

For example, for the sake of simplicity let us assume that we observe, over a given time period, t, four consecutive peaks in the number of disturbances recorded on a particular star, and that these peaks are regularly spaced at intervals t/4.

Furthermore, suppose we observe troughs in our curve, i.e., relatively quiet and undisturbed periods, occurring at t/6, t/3, and 2t/3. This is shown in Fig. 3 (p. 10).

Now we know that angles of 0°, 90°, 180°, and 270° produce disturbed conditions, while angles of 60°, 120°, and 240° result in relatively undisturbed conditions. From this information, plus the curve we have postulated, one of the possible conclusions that can be drawn is that two major planets are chiefly responsible for the effects being observed, both the disturbed as well as the quiet periods. By studying the time differences between the peaks and troughs on the curve it can further be concluded that the period of revolution of one of the planets is twice that of the other.

It is also reasonable to assume

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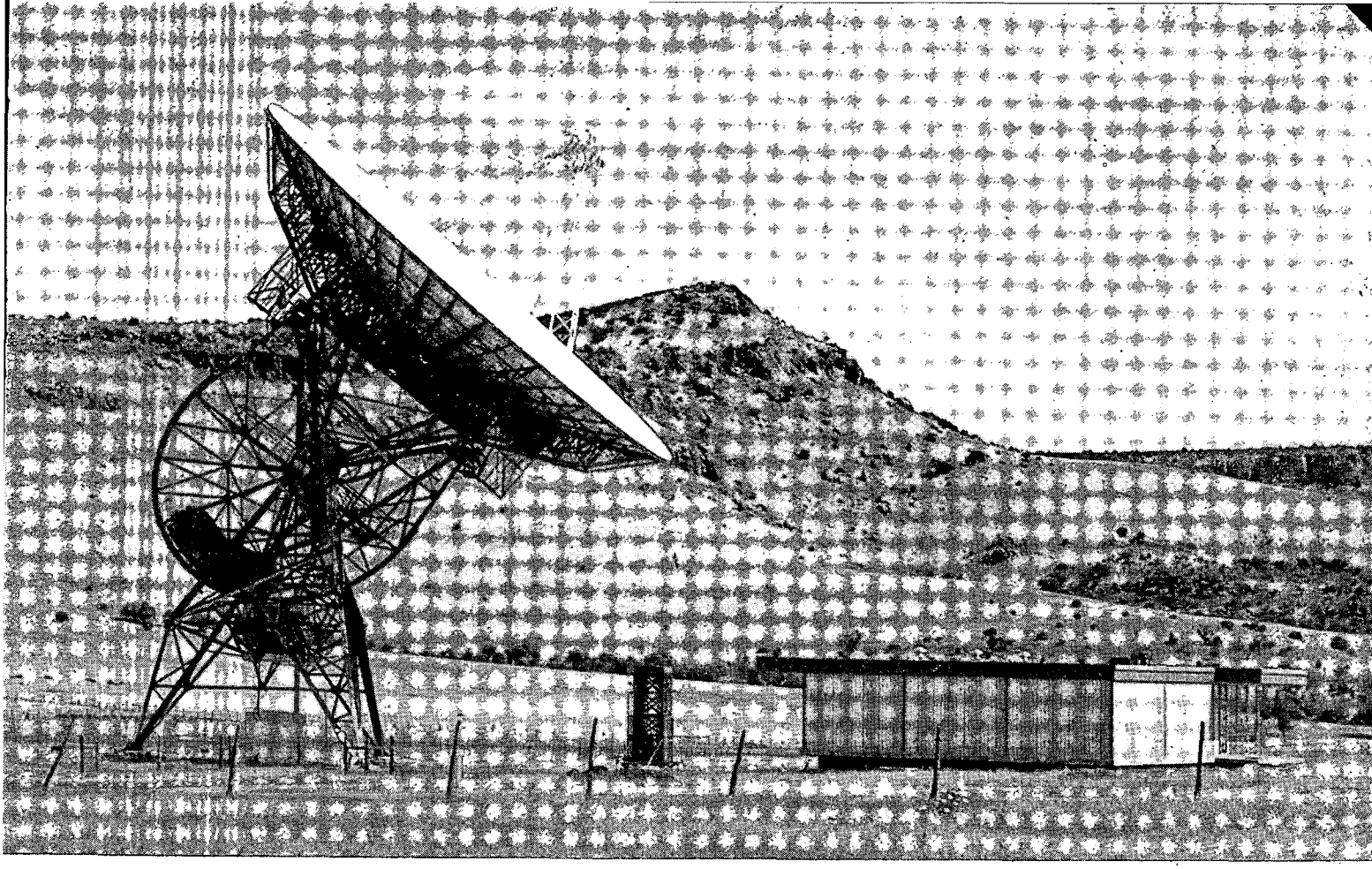


Fig. 9: This is the general scene—at Harvard Radio Astronomy station, at Fort Davis, Texas. The station is located in a broad valley of the Davis Mountains, of West Texas, where man-made local radio interference is at a minimum.

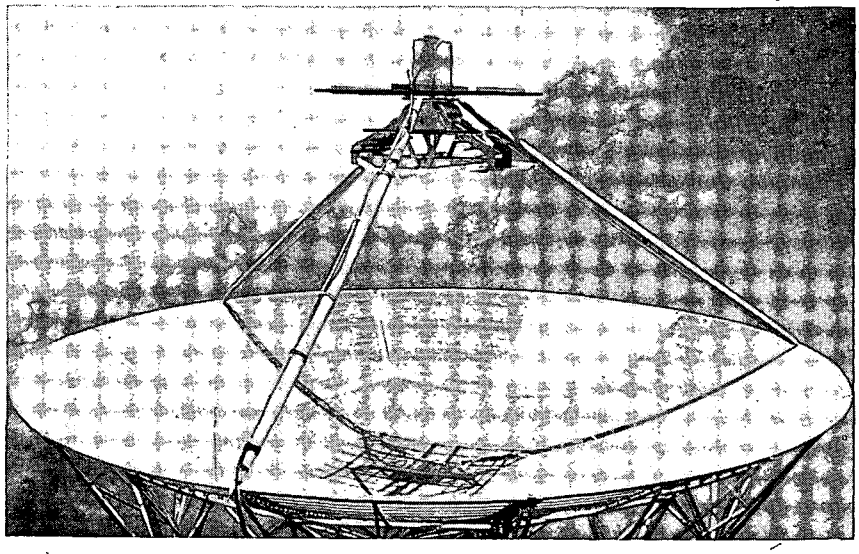
that these two planets are the most massive in that particular solar system, since Saturn and Jupiter, the two most massive planets in our system are of prime importance in the effects they have on the sun.

How much more can be determined? This will depend on the characteristics of the curves which the particular star under investigation gives us. The chances are, that given rules 1 to 7 which Mr. Nelson has provided, plus detailed information about the disturbances that have occurred on a particular star over a significant period of time, that a good deal of information about that star's planetary system can be gained.

On the other hand, we can't expect initially that our study will give us all the answers. An observer on a distant planet studying our solar system on the basis of disturbances on the sun, and using Mr. Nelson's rules, would get no evidence of the existence of Uranus, Neptune, or Pluto because these are too far away to have disturbance effects on the sun.

Fig. 10: And this is the 28-foot parabolic dish, with the antenna equipment designed to cover the range from 100-580 megacycles, and 2,100–3,900 megacycles.

Harvard Radio Astronomy Station



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Which Stars Have Planets?

What we can do, however, is to program a computer with data about our solar system, about the sun, about angular relationships between our planets and solar disturbances, then supply the machine with data about the star under investigation, such as position on the main sequence, rotational velocity, diameter, luminosity, et cetera; it can reasonably be expected that the machine will then supply us with much more information than is presently available.

Additional data about the star and its planets could be obtained by studying the star's ultraviolet radiation so as to determine the duration of its sunspot cycle.

Since sunspots are a major source of solar ultraviolet radiation, plotting the variation in ultraviolet light emitted by a star over a long period of time would enable us to determine the length of the sunspot cycle of that star. This information would be of considerable use in gathering additional information about its planets.

For example, the duration of our sunspot cycle averages somewhat under 11.1 years between one minimum and the next one. The periods of revolution of the four most important planets in the method used by Mr. Nelson are: Earth, 1 year; Mars, 1.88 years; Jupiter, 11.86 years, and Saturn, 29.46 years. *The average period of revolution of these four most important planets is 11.05 years.*

It is of interest to note here that the period of revolution of our most massive planet, Jupiter, is 11.9 years, and that Jupiter and the other planets carry ninety-eight per cent of the angular momentum of our solar system, with the sun having only two per cent of the total. It has been pointed out that the rotational velocity of stars on the main sequence is subject to considerable variation, with spin varying from over two hundred kilometers per second to values that are extremely low. It is entirely possible, as in the case of our sun, that stars with low angular momenta have had their spin absorbed by planetary systems.

FINDING INHABITED PLANETS

Finally, there is the question of locating habitable planets in the galaxy. With more than two hundred billion stars in the system, we obviously cannot monitor all of these. We have already proposed a program of monitoring flare stars to determine as much as we can about their planets.

But we are, in addition, interested in finding out which stars have planets capable of supporting life. This is perhaps of even more interest than studying the planetary systems of stars that for one reason or another cannot support life. This condition narrows our field of investigation significantly, for certain critical conditions must be met before life can evolve.

CONDITIONS NECESSARY FOR LIFE

It is estimated that intelligent life took from three to four billion years to evolve here on earth. Lacking other information with which to work it is necessary for us to use this figure as a frame of reference and assume it would take that long for intelligent life to evolve on other planets. The first critical condition, therefore, is that the age of the star we are considering be at least three billion years.

Second, the star must radiate sufficient heat for there to be an appreciable habitable zone. That is, the region around the star in which the temperature range is favorable for the development of life must be large enough for there to be a significant chance of a planetary orbit falling within it.

Obviously, a very old star with low luminosity, although it fulfills condition One will probably not have as large a habitable zone as a somewhat younger, more luminous star, such as our sun.

Finally, the planet must have a stable orbit, so that in its motion around the parent star it remains at all times within a zone of favorable temperature range. A planet with a highly eccentric orbit, for example, is not likely to give rise to life as it passes from extreme heat to extreme cold in its travels, even though it passes through a relatively temperate zone.

THE MAIN SEQUENCE

We can go a long way toward determining which stars fulfill our critical conditions by studying their spectra.

Thus far, nearly half a million stars in our galaxy have been categorized, and the vast majority of these array themselves in a continuous sequence according to their spectral characteristics.

These stars, which are referred to as "main sequence" stars are designated by the letters O, B, A, F, G, K, and M.

All O stars, for example, show prominent lines of ionized helium, oxygen, and nitrogen, while M stars show strong bands of titanium and vanadium oxide.

All O, B, and A stars are blue, F and G stars are yellow, and K and M stars are red.

The differences in stellar spectra are not caused principally by differences in chemical composition. These differences are primarily a function of the temperature of the star; O stars are hottest, M stars are relatively cool.

For each letter there is a further subdivision ranging from 0 to 9 to further differentiate temperature differences within each group. Thus, an A5 star is hotter than an A7, which in turn is hotter than an F0.

By plotting spectral characteristics vs. luminosity—energy output per unit time, using the sun equal to 1—we find most stars are arrayed in sequence in a narrow band as

Continued on page 91

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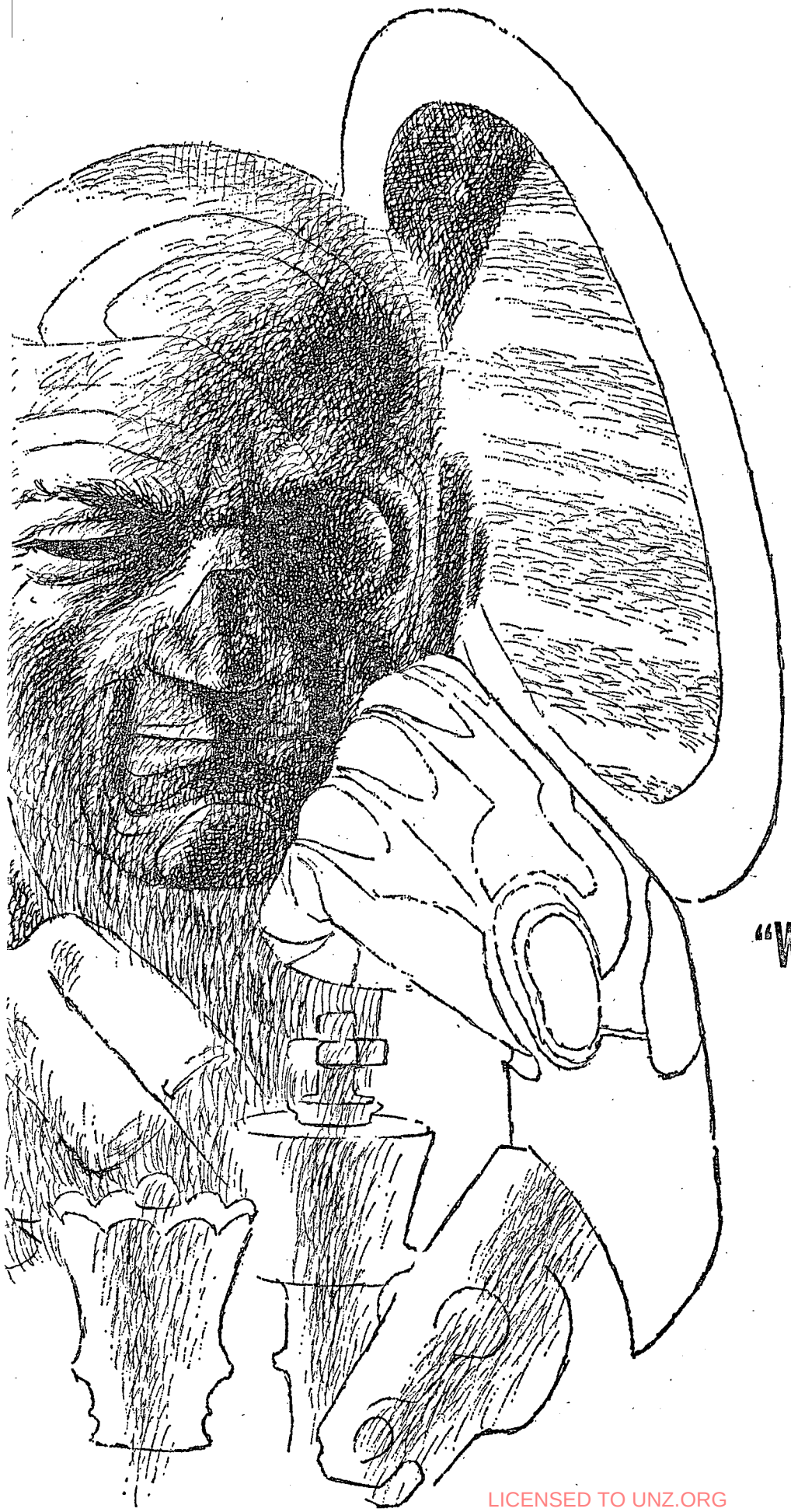

"WHAT'LL YOU GIVE?"

Economics is, was, and always will be the basic controlling factor behind the actions of a culture, or a man IF, AND ONLY IF, you include emotion as an economic reality!

by WINSTON P. SANDERS

ILLUSTRATED BY JOHN SCHOENHERR

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K—B2.

Q—K7. "Check," said Roy Pearson.

Captain Elias ben Judah did not swear, because it was against his principles. But his comment was violent enough. "Second blinking check in a row," he added, moving the black king to refuge at Kt3.

"*And* the third," said his operations manager with a parched chuckle. The white queen jumped in his artificial hand to Q8.

"Do you mean that?" asked Ben Judah, astonished. He was a medium-sized man, fifty Earth-years old, his hair gray, his eyes brown and gentle in a face that sagged a little with weariness. The blue uniform of the Jupiter Company sat neatly on him; insignia of rank and service, ribbons of past achievement, glowed beneath the fluorescent overhead of his cabin. It was more homelike than most, that cabin. Besides the usual pictures of wife and children, he had a shelf of books, not microspools but old-style volumes, for the pleasure of binding and typography. In a corner stood a little workbench where he had half completed a clipper ship model. Above was a flowerbox bright with poppies and violets.

Pearson's ruined features twisted into a grimace. "I do," he snapped. "Want to resign?" He was small and hunched, five years younger than the captain, but looked ten years older—not entirely because a goodly fraction of him was prosthetic.

"Certainly not." R X Q.

"I expected that, you know," said Pearson. His bishop scuttled across the board and captured the black queen. "Check . . . and mate."

Ben Judah studied the board for a moment before he sighed. "Right. Good game."

"You could have had me a while back," Pearson said, "when—"

"Never mind." Ben Judah got up and moved across the deck, heavily under the ship's internal gyrogravitic field, to his dresser. He began to load an old pipe. "I'm afraid I can't concentrate on chess. I keep thinking about the pilots."

Pearson observed him narrowly. "Don't," he said.

"I must. I'm the captain."

"Not in their case. I am."

"*Nu?*" Ben Judah swung about, indignant. This was his first Jupiter-diving cruise, and he admitted there was much he didn't yet know. But—

"You are the captain of the mother ship," Pearson said. "However, we're in orbit now. Only the scoopships are under weigh. And I direct their operations. Under the laws of the Republic, they're my responsibility. You'll find working for the Jupiter Company is a lot different from an inner-plant merchant run."

Ben Judah relaxed. "You needn't tell me," he said with a rather wan laugh. "Everything in the Belt is different. I don't envy you, trying to keep those wildcats of yours under control." He sobered. "But what disturbs me—now that I'm here with the actuality, not a textbook abstraction; now that I *feel* what is involved—what makes me wonder if I should have come at all, is the business of sending men out time after time, ordering them to possible death, while we sit safely here."

"They aren't ordered," Pearson reminded him. "Any pilot may refuse any flit. Of course, if he does it repeatedly, he'll be fired. We can't afford to ship deadheads."

"I know, I know. And yet, well, you asterites are obsessed with economics." The captain lifted a hand to forestall the manager's retort. "I am quite aware of how closely you must figure costs. But there's a . . . a callousness in your attitude. You often seem to think a machine is worth more than a human life."

"It is, if several other human lives depend on it." Pearson gave him a quizzical look. Himself an introvert, he had not yet gotten to know the new skipper very well. "Why did you come to the Belt, anyhow?"

Ben Judah shrugged. "I was approaching compulsory retirement age. Earth's too crowded for my liking. Besides, spacing is my trade, the thing I want most to do. JupeCo offered me good pay for as long as I'm able to stay in harness. Also a downright luxurious homeship for my family. I've no personal complaints. But sometimes I can't help wondering, meaning no offense, if I want my children to grow up as asterites."

He flipped a switch on his viewscreen. The panel darkened into a simulacrum of the outside, uncountably many frost-cold stars, the curdled ice of the galaxy, and Jupiter. The planet hung monstrous in its nearness, amber with multitudinous colored bands, blotted by storms that could have gulped all Earth, the Red Spot a glowing ember. One moon was coming into sight around that terrible horizon. Its face was tinted saffron by reflection.

"Live men, diving into yonder kettle of hell," Ben Judah said low. The susurrus of the ventilators made an undercurrent to his words, as if the ship tried to tell him something. "And it isn't necessary. You could automate the operation."

"Doubling the capital investment in every scoopship," Pearson said. "Also increasing the rate of loss by an estimated twenty-five per cent. Too many unforeseeable things can go wrong down there. An autopilot can only act within the limits of its programming. A man can do more. Sometimes, when he runs into trouble, he can bring his ship back."

"Sometimes." Ben Judah's hands returned blindly to his pipe. He finished stuffing it, touched an igniter to the tobacco, and blew nervous puffs.

"We get more applications than we can find qualified men to accept," Pearson said. "Pay, prestige. And most of the boys actually enjoy the work."

"Maybe that's why I'm scared," Ben Judah said. A corner of his mind observed that his English hitherto Oxford with an Israeli accent, was slipping into the Belt dialect. The citizens of the young Asteroid Republic had

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every national origin, but North Americans predominated and put their stamp on language and folkways. "When my sons are grown, they might put in for those berths . . . and get them."

Master Pilot Thomas Hashimoto eased his craft away from the mother ship with a deftness born less of experience in this job than of several years of Earthside test piloting. His motions at the control board were nearly unconscious. Most of his attention was on the view before him.

His heart knocked. *I'm not afraid,* he assured himself. *I can't be. At least I'd better not be. This isn't any more dangerous than what I did back home.*

The thing is, though, I was doing those things there.

"Clear track," said the dispatcher's radio voice. Static buzzed around the words. No tricks of modulation could entirely screen out the interference of Jovian electrical storms. "Good gathering, Tom."

"Thanks," said Hashimoto, mechanical response to a ritual farewell. "Roger and out." His eyes focused on instrument needles, his fingers jumped over switches. The computer clicked and muttered. Otherwise the cockpit was silent, making the beat of blood loud in his ears. He grew conscious of the spacesuit enclosing him, a thick rubbery grip. Its helmet was left off, like its gloves, until such time as an emergency arose. So his nostrils drank smells of machine oil and that ozone tinge which recycled air always has in close quarters. For the minute or two that he traveled in free fall he felt weightlessness; scoopships didn't waste mass on internal field generators. But there was no dreamlike ease to the sensation, such as he had known in other days. The seat harness held him too tightly.

The computer gave him his vectors and he applied power. The nuclear reactor aft was noiseless, but the Emetts of the gyrogravitic generators whirred loudly enough to be heard through the radiation bulkhead which sealed off the engine compartment. Field drive clutched at that fabric of relationships which men call space. Acceleration shoved Hashimoto back into his seat. *Mary Girl* leaped Jupiterward.

He had a while, then, to sit and think. This interval of approach under autopilot was the worst time. Later the battle with the atmosphere would occupy all of him, and still later there would be the camaraderie of shipboard. But now he could only watch Jupiter grow until it filled the sky. Until it became the sky.

The trouble is, he realized, *I'm so near the end of my hitch. I didn't count the days and the separate missions at first, when I began this job. But now that there's only a few more months to go—*

Three years!

He hadn't needed to stay in the Belt that long, as far as his wife was concerned. She wanted desperately to have children, yes, and her frail body would miscarry again and again unless she spent each pregnancy under next-to-zero weight, and obstetrical facilities for that kind of condition existed nowhere but in the Asteroid Republic. (No country on Earth would spend money to establish a geegee-equipped maternity hospital, or an orbital one; anything that increased population, however minutely, was too unpopular these days.) Hashimoto had been more than glad to land a contract with JupeCo that enabled them to move out here. But two healthy children were plenty. Now they wanted to return home.

However, JupeCo insisted on a minimum of three years' service, and the bonus he would lose by quitting before the term was over amounted to half his total pay. He couldn't afford it. No contract that harsh would have been allowable in North America. But once they concluded their war of independence, the asterites had gone their own way.

It was not Hashimoto's. He remembered too well how sunset touched the mists in San Francisco Bay and made it a bowl of gold, how gardens lay vivid and trees stood rustling about his house in the Marin County hills, how men moved and spoke and exchanged friendship according to rules worn gentle with long usage. The asterites were as raw and stark as their own flying mountains.

He did not fear Jupiter because it could kill him. Any untried spaceflitter might do that at home. But it would be horrible to die without having slept once more in the house that had been his grandfather's, and having walked Earth's living soil and felt Earth's wind on his face.

Or without seeing his and Mary's children grow into the heritage that was theirs.

Throttle down, Hashimoto told his mind. *You've got work to do.*

The scoopship thrummed around him. Through the low, thick inertrans canopy he looked forward along the flaring nose. By twisting his neck he could have looked aft to the tapered stern. The metal shimmered blue in the light that poured from Jupiter. He could not see that open mouth which was the bow, gaping upon emptiness, but he could well visualize it. He had watched the service crew often enough, to make sure that their periodic inspections of every accessible part were thorough. *Mary Girl* was getting along in years, as divers went—which wasn't very far. (She had been *Star Pup* when passed on to him, but every pilot had the right to name his own craft.) Hashimoto didn't trust his life to someone else's estimate of her soundness. Most of his fellows did; but then, most scoopship pilots played a hell-for-leather role that he secretly considered rather childish.

They were good Joes, though, he thought. He must admit he would miss that gang. Often on Earth he would remember escapades and shared laughter.

And by the Lord Harry, it was something to steal

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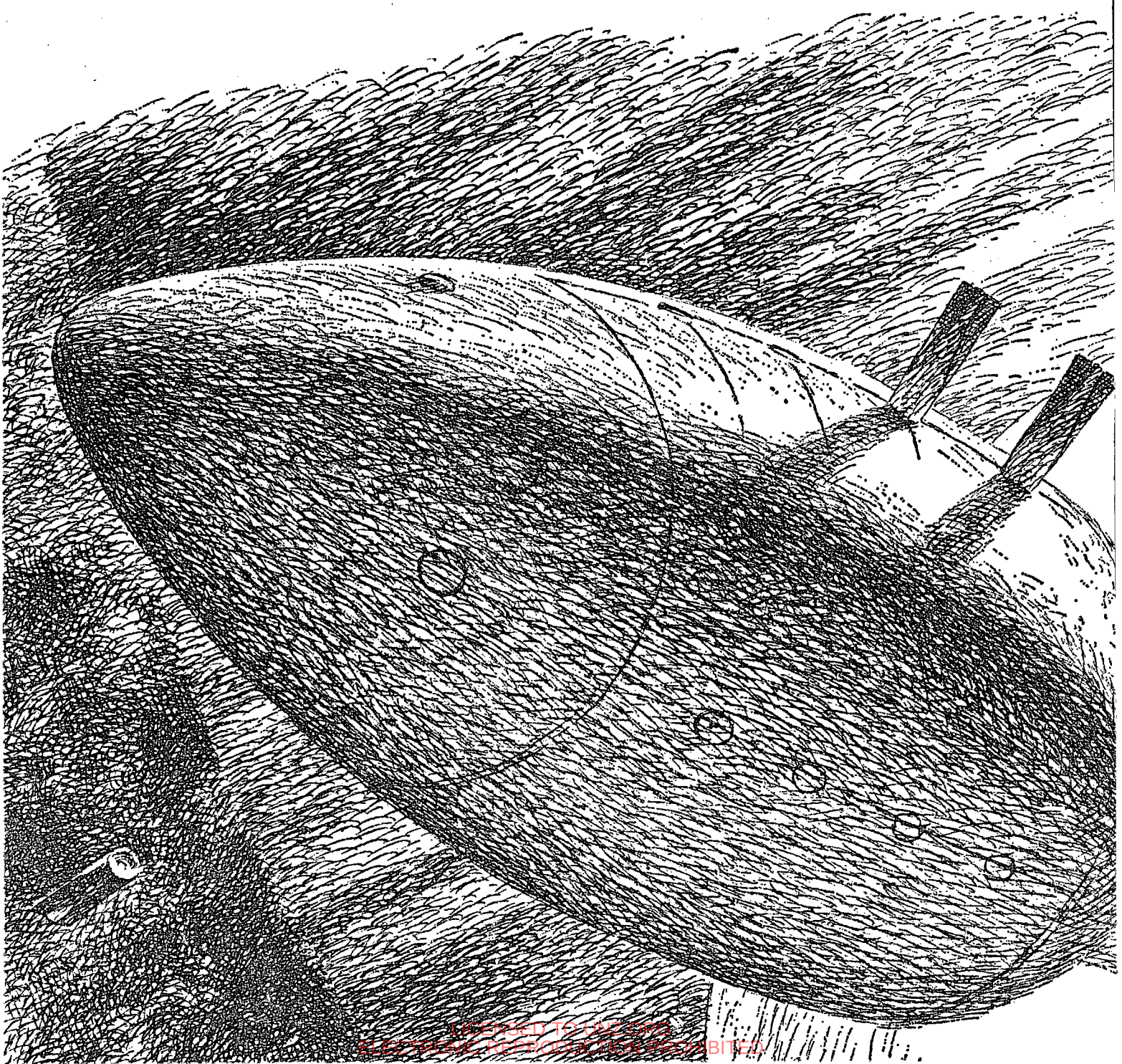
from Jupiter himself and come back to brag about it!

The ship drove onward.

Eventually the planet filled his entire vision. But then it was no more a planet, hanging in heaven; it had become the world. It was not ahead but below. Cloudfields stretched limitless underneath him, layered, seething, golden-hued but streaked with the reds and browns, greens and blues of free radicals. To port he saw a continent-sized blot of darkness that was a storm, and shifted course. Deceleration tugged angrily at him, and the planet's own pull, nearly three times Earth's. His muscles fought back. The first thin keening of cloven air penetrated to him. The ship quivered.

He switched off the autopilot and plunged downward on manual. The noise grew until it was thunder, booming and banging, rattling his teeth in the jaws and his brain in the skull. Winds did not buffet this craft traveling at many supersonic speeds, but gigantic air pockets did, back and forth, up and down, till metal groaned. Darkness overwhelmed him as he passed through a cloud bank. He emerged below it, looked up and saw the masses towering kilometer upon kilometer overhead, mountainous, lightning leaping across blue-black cavern mouths and down the faces of roiling slaty cliffs, against a distant sky that was hell-red. Briefly an ammonia storm pelted him, the hull drummed with the blows of gigantic poisonous hailstones. Then he was past, still screaming downward.



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Presently he was too deep for sunlight to touch his eyes. He flew through a darkness that howled. He ceased to be Tom Hashimoto, husband, father, North American citizen, registered Conservative, tennis player, beer drinker, cigarette smoker, detective-story fan, any human identity. He and the ship were one, robbing a world that hit back.

The instruments, lanterns in utter murk, told him he was at sufficient depth. He leveled off and snapped the intake gate switch. The atmosphere ceased to whistle through the open tube of the hull—for now the tube was closed at the rear. A shock of impact strained him against his harness. The ship bucked and snarled. He reduced the drive to let the atmosphere brake him.

That air was mostly hydrogen and helium, but rich in methane, ammonia, carbon dioxide, water vapor; less full of ethylene, benzene, formaldehyde, and a dozen other organics, but nonetheless offering them in abundance. This far down, none of them were frozen out. The greenhouse effect operated. Jupiter's surface was warm enough to have oceans like Earth's. No man had seen them. The weight of atmosphere would have crumpled any hull like tinfoil. Even at this altitude, *Mary Girl* sped through an air pressure several times that of sea-level Earth.

Rammed into her open bow by sheer speed, the gases poured through a narrower throat. The wind of their passage operated an ionizer and a magnetic separator. Most of the hydrogen and helium were channeled off into a release duct and thrown away aft. Some of the other gases were too, of course, but there was more where they came from. An enriched mixture flowed—hurtled—through rugged check valves into the after tanks.

The process did not take long. This was actually not the time of maximum hazard—though ships had been known to break up when the stress proved too much for some flaw in their metal. The dive downward from orbit had killed most men, and the climb back was not always completed. Gales, lightning, hailstorms, supersonics, chemical corrosives, and less well understood traps could be sprung. If the pilot was simply knocked unconscious, or lost control for a couple of minutes, Jupiter ate him.

A needle crossed the Full mark. The intake gate opened again and the tank valves shut. Hashimoto swung the ship's nose toward the hidden sky and poured power into the field drive.

He was once more out in sunlight, a storm-yellow dusk that showed him nothing but a cloud wrack tattered by wind, when his engine began to fail.

Master Pilot Charles de Gaulle d'Andilly approached the mother ship with a song. What a dive that last one had been! He was still ashiver from it, tumbling end over end in a doomsday blackness until he found an updraft that he rode toward safety. Within the spacesuit, his Long John sopped sweat. He wanted a drink in the worst way. There were only two kinds of occasion when every cell of a man's body was absolutely alive, and Jupiter expeditions didn't take women along.

He'd compensate himself for that when he got back to Ceres. Few girls could resist a scoopman's uniform and reputation. Especially when Charles de Gaulle d'Andilly wore them.

". . . Dans le jardin d' mon père
Les lilas sont fleuris.
Tous les oiseaux du monde
Y viennent fair' leur nid.
"Auprès de ma blonde
Qu'il fait bon, fait bon, fait bon . . ."

The radio receiver buzzed. He flipped the switch. "*Vesta Castle* calling ship detected at—" The dispatcher's voice gave co-ordinates which indicated him. "Come in, please."

"*Mignonne* responding to *Vesta Castle*," said d'Andilly. "Everything O.K."

"Hi, Chuck. How was the trip?"

"Rough. Later I shall elaborate my experiences for you at some length. But being me, I had no unconquerable problems. So give me a guide beam to discharge, please."

"Roger." Cartesian axes flickered to life within the globe of a signal 'scope. D'Andilly aligned the dot that represented his own craft and rode on in. Approach must be under his personal control, with Jupiter's radio interference potentially so great. Nevertheless, he needed to devote little of his mind to it. After a dive, the matching of vectors in space was nothing but relaxation.

"Auprès de ma blonde
Qu'il fait bon dormir!"

His thoughts drifted back to that certain blonde who was responsible for his having left the United European Space Corps a few years ago. He didn't blame her. He should have known better than to play games with the daughter of his commanding officer. But she was so very tempting. He might try to find her again, when at last he must retire; Jupiter-diving was not for men past thirty-five or so. No, she was doubtless married by now. Well, there would be many others. And it would be good to stroll along the Seine, nurse an aperitif in a cafe on the Champs-Elysées, dine on civilized food before proceeding to the opera. He had no intention of staying in the Belt forever. With his accumulated pay he could buy into a good small business on Earth and live like a gentleman.

Not that he regretted his time out here. It had been glorious fun, mostly.

The *Vesta Castle* grey before his eyes, a great metal egg with softly glowing ports, the smooth curve broken by turrets, air locks, and boat blisters. Her orbit had carried her near the Jovian terminator line, so that the shrunken sun glared hard by the vast hazy crescent of the planet, but there was still ample light. Shadows lay

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sharp across the hull. Large though it was, it was dwarfed by the balloon harnessed to the stern. And the latter would double its present radius before it was considered full.

D'Andilly edged close to the gas bag. He could see stars through it. The plastifilm had to be thin, to save mass. He didn't worry about ripping it in case of collision. That elastomer was quite incredibly tough, could even bounce back small meteorites. But one could all too easily start the whole awkward ship-and-balloon system twisting around three simultaneous axes, and have the devil's own job getting rid of that angular momentum.

On such a whisper of drive that he felt no weight worth mentioning, he matched velocities. A radar at the balloon's main valve locked onto him. He followed the beam to within meters of target. A hose snaked out from *Mignonne's* stern, its nozzle driven by a miniature geegee and homing on the valve. They coupled. Between them, the pilots of the two ships killed what slight rotation was induced.

Pumps throbbed, forcing the scoopship's cargo of Jovian gas into the balloon. The sphere did not expand much; a single load was a small fraction of its total capacity. D'Andilly continued working to balance forces and hold the entire system steady in orbit.

At the end, he directed the hose to uncouple and retract. Then he slipped smoothly toward his assigned blister on the mother ship. This far spaceward there was seldom need to operate hydromagnetic screens against solar particle radiation, so approach and contact were simple. While he got out of his harness and suit, the final adjustments of angular momentum were made. The balloon waited quietly for the next arrival.

Who would not be d'Andilly. He had twenty hours off till he dove again.

Whistling, he climbed through joined air locks into the *Vesta Castle*. Two maintenance men waited in the companionway to clean his gear. Afterward the ship would be inspected. That was no concern of d'Andilly's. He gave the tech monkeys a greeting less condescending than compassionate—imagine so dreary a job!—and sauntered to pilot's country: a short, stocky man, brown hair carefully waved and mustache carefully trimmed, blue eyes snapping in a hook-nosed square face.

Ulrich von Raaben, tall, blond, and angular, was emerging from the showers as d'Andilly entered. "Whoof!" he exclaimed. "You smell like an uncleaned brewer's vat." He saw the condition of the undersuit that the Frenchman began to strip off, and paused. "Bad down there?"

"I hit an unobserved storm," d'Andilly said, as casually as he could manage.

Von Raaben stiffened. "We shall have a word with the weather staff about that."

"Oh, I will report the matter, of course. But they cannot be blamed. It must have risen from the depths faster than normal. Our meteorologists can only observe so far down."

"A cyclonic disturbance does not rise for no reason. Surrounding conditions ought to give a clue, at least to the probability of such a thing happening. If they tell us a given region looks calm, and it proves not to be, by heaven they will have some explanations to make!"

D'Andilly cocked his head at the other. "You are too Prussian to believe. Where were you born . . . Milwaukee?" Von Raaben reddened. D'Andilly slapped his back and laughed. "No matter, *mon vieux*. For a filthy Boche you are quite a good fellow."

He ducked under the shower and wallowed in an extravagance of hot water. That was one of numerous special privileges enjoyed by the scoopship pilots. Others included private cabins, an exclusive recreation room, seats at the officers' mess with wine if desired, high pay, and a dashing uniform that one was free to modify according to taste. In exchange they made a certain number of dives per Earth-year, into Jupiter.

One must be young and heedless to strike such a bargain. Sensible men, even among the asterites, preferred a better chance of reaching old age. No wonder that scoopship pilots off duty tended to act like ill-disciplined sophomores. *Including me, no doubt.*

There are exceptions, to be sure. Like poor Tom Hashimoto. I should take him out with me when we reach Ceres and show him the proper way to valve off accumulated pressure. But no, he is much too married.

In his own quarters d'Andilly put on lounging pajamas. From there he proceeded to the rec room. He found von Raaben, battered and eagle-decorated military cap shoved back on his head, playing rummy with Bill Wisner. The latter, who affected loud clothes and foul stogies, was one of the few native-born asterites aboard. Immigration was still ahead of birth in expanding the population of the Republic.

"Hi," Wisner said. "I hear you hit some weather."

"Yes. I'd best report it before someone else dives into that region." D'Andilly observed the glasses on the table and headed for the liquor cabinet himself. "Are we the only ones here?"

"The only divers, yes," von Raaben said in his meticulous way. "None others are due for several hours, I believe." The scoopships operated on a staggered but loose schedule, and no one liked to discharge by starlight alone. Those who had completed a flit would assume parking orbits and rendezvous when the *Vesta Castle* was back in the sunshine.

"Well, the more for us, then." D'Andilly poured a stiff drink, tossed it off, and sipped appreciatively at a second. "Ah! Praise be that the cognac is holding out. When we are reduced to asterite booze, then it is time to head for Ceres, and never mind whether the balloon is full or not."

"Oh, Comet Blood isn't that bad," said Wisner defensively.

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"It is for any man whose palate was not burned out by it in infancy. Your synthetic liquor is one excellent reason I shall not remain in the Belt after they shelve me as a diver."

"You ought to, though, Chuck," Wisner said with characteristic patriotism. "The life's rough and risky, sure. But with any luck at all, you stand to make a fortune. And no bureaucrat's going to tax most of it away and tell you how you can spend the rest, either."

"True. I admire the pioneer spirit, in an abstract fashion. But do you see, I am not interested enough, myself, in wealth or fame or power. There are so many other things to do."

"If one lives that long. Well—" von Raaben raised his own glass. "*Prosit.*"

"May we love all the women we please," Wisner toasted, "and please all the women we love."

D'Andilly was about to propose something equally traditional when the emergency summons cut loose.

The wardroom was also used for briefings and conferences. Captain ben Judah stood looking down the green length of the table. Roy Pearson sat on his right, the chief engineer on his left, other officers not on watch beyond them. But the three scoopship pilots, clustered at the foot, were those whose eyes he must meet.

He felt sick. The words dragged from his throat:

"Gentlemen, we have received a call. Hashimoto is down."

There could be no adding to the silence that followed. But Wisner lost color and von Raaben slowly took off his cap.

"Not exactly down, yet," Ben Judah went on. "His engine quit on him. But not too suddenly. When it first began misbehaving, he got as high as he could and threw himself into orbit. That's how we were able to receive his 'cast. He was above the sources of atmospheric interference, though it was still bad enough."

D'Andilly half rose. "*Pardieu!* Why do we sit here? I can go fetch him myself."

"If he were in clear space, yes," Ben Judah said. "But he didn't get that far. There's still a trace of gas where he is. Frictional resistance— He's spiraling inward."

"How fast?" von Raaben barked.

"That can only be estimated. We know his approximate altitude, from the orbital velocity as given by Doppler shift of his signal. That is thirty-one-point-five kilometers per second, in the same sense as our own path. On the basis of the average density-altitude relationship in the Jovian atmosphere, the weathermen figure he should . . . should start burning in five or six hours."

"No chance that Stuart or Dykstra or any of the others can give a hand?" asked Wisner.

"We've tried to raise them," said Ben Judah. "No luck, as expected." Only a tight beam could drive a recognizable message from the *Vesta Castle* to a scoopship deep in the radio chaos of Jupiter's air. And the exact position of such a ship was never known—constantly and unpredictably changing, anyway. A broadcast could be received by a man in clear space, over considerable distances. But the parking orbits of those who had taken on full loads and were waiting to rendezvous on dayside were eccentric ellipses, crossing the mother ship's circle at the space-time point of the meeting. Now Jupiter lay between, a wall to block off any cry. Unless some man still in its neighborhood should find some reason to call, and come around the edge of the radio shadow for that purpose, there was no measurable probability of getting in touch.

"We could accelerate toward dayside ourselves, couldn't we, till we can get a 'cast through?" asked the engineer.

"Don't be ridiculous," Pearson snorted. "We could, sure. But they'd all be far out, farther out than we are now. It would only waste time."

"So the problem's ours," Wisner said. "Well, I don't see why you're looking so down in the nose about it. What the hell, even at one gee a scoopship gets from here to the atmospheric fringes inside of two hours. Let's see . . . if you got his call a few minutes ago, he must still be on our side of Jupe, and his period just about three hours. You don't gain much by flitting a high-acceleration curve over such a short distance, seeing that you also have to brake, but you do gain a little. Yes, I think I can meet him in something like two hours. Three at the most, to allow for matching speeds and so forth . . . Sure, we can do it. Assume I start out half an hour from this moment at five gees, and have a curve computed for me. It'll take me that long to get ready. Got to dope up with stim and gravanol—"

"No, I shall go," said d'Andilly, and, "*Nein, ich,*" von Raaben. They began to rise.

"Sit down!" rapped Pearson.

Men's gazes focused on him, the ship's officers' with incomprehension, the pilots' with flaring resentment. The manager clamped his lips together for a space before he asked, "Precisely what do you propose to do?"

"Equalize velocities, couple air locks, and take him aboard," said d'Andilly. "*Voilà!*"

"Easy in space," Pearson said. "But do you realize that he's in atmosphere?"

"Very thin atmosphere thus far," the engineer said. "Nearly a vacuum."

"He'll be down where it's thicker by the time another ship can arrive," Pearson said.

"If he has five hours to go before he hits such a density that metal volatilizes," d'Andilly said, "it will not be too thick three hours from now for a scoopship hull to stand obital speeds."

"No. You can't do it, I tell you."

D'Andilly reddened. "Well, perhaps not. But we must try, or stop claiming to be men."

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"Very dramatic," Pearson scoffed. "Too bad the laws of physics don't sympathize."

"What do you mean?"

"Look, I admit the air friction is slight where he is now. If only we could contact one of the men now diving, rescue would not be hard. But by the time you can reach him, he'll be down to a level where it's considerably worse. Oh, the air will still be tenuous, upper stratosphere density or less. Aerodynamic forces will tend to keep the hull aloft, preventing an extremely quick plunge to destruction.

"But . . . at thirty-odd KPS, that thin air is equivalent to an Earthside wind of more than hurricane force. It doesn't much resist the smooth, streamlined shape of a hull with an open gate; they're designed that way. But how does your screw engine open an air lock against such pressure? How can a tube be extended and secured? You'd accomplish nothing except to generate so much turbulence that your own craft would spin out of control."

D'Andilly sank back in his chair.

"Grapple onto his hull, then, and bring home ship and everything," von Raaben said.

"You can't do that either, for the same reason. The grapnel field doesn't seize hold till it's within a centimeter or so of metal. Otherwise the thing would be unmanageable in space. In such a wind, you'd never be able to swing it into contact."

"Are you certain of that?" Wisner asked.

"Certain enough," Pearson said.

"That means you aren't one hundred per cent sure. Who could be, with so many unknowns in the equation? O.K., we'll see. Personally, I think that we three between us might well be able to slap a claw or two on him."

"No. You'll only get tossed against each other in the attempt. I don't consider suicide heroic."

"You just can't understand, can you?" Wisner said in a soft voice. "Tom Hashimoto is one of ours."

"He isn't, really. He's not planning to renew his contract."

"So what? I've drunk his beer too often. His wife's a hell of a sweet girl. You think I can go back to Ceres and tell her we didn't even try to rescue her husband?"

"If it will make you feel better," Pearson said coldly, "I'll turn that into an order. You stay put."

"*Tu chameau pouilleux,*" d'Andilly whispered. He climbed erect, with a loud suggestion for the manager's private recreation. "Let us get started, friends."

"Sit down!" Pearson shouted. A vein pulsed in his temple, above the plastic that replaced his right cheek. "Or do you want to face charges of mutiny?"

"*Monsieur le capitaine.*" D'Andilly turned to Ben Judah. "I appeal to you."

"I . . . no, I am not a diver," the Israeli croaked. Sweat glittered on his forehead. "I can't go against a man who knows the subject better than I do."

D'Andilly spat on the deck. "He's no diver himself."

Von Raaben tugged at his companion's sleeve. "Sit, Charles. Contain yourself. This does nothing." By main strength he dragged d'Andilly back into his chair, then looked squarely at Pearson and said:

"Perhaps you do not know what morale means. I have heard a story about the British in one of their wars with my ancestors. Their army was beaten on the Continent and had to evacuate or be captured. The men were taken onto ships off Dunkirk. Afterward the naval commander whose warships had given what help they could was reproached for taking so great a risk. If we had brought up our own battleships and heavy artillery to the narrows, or if a storm had arisen, he would have lost his entire fleet. Let me tell you what he replied. 'We could build another fleet in four or five years. But it would have taken us three hundred years to build another tradition.'"

Pearson's eyes dropped. He stared for a space at his artificial hand, inert on the table. Finally he said, "But I do know. I was a space pilot once myself. Not scoop ships, no, but prospecting, which is pretty dangerous, too, in a rock cluster. Some good friends of mine died in the same collision that shelved me. I managed to get into an intact compartment, alone. But I'd soon have died too, if the survivors hadn't risked their necks to search the debris for casualties.

"But . . . that was sound doctrine. The ship was a total loss. Nothing more was being hazarded except men, who'd die in any event if they couldn't pool their efforts to jury-rig succient shelter until help came. This case is different. You have to multiply values to be gained or lost by the probability of success or failure. Exposing three ships and three men to a very high chance of destruction, for the sake of one ship and one man whom there's only the smallest likelihood of saving . . . no, that's much too bad economics."

"*Economics?*" d'Andilly exploded.

"That's what I said," Pearson answered. Steel underlay his tone. "The dollar cost of building and outfitting a ship, of training and equipping a man. It's the only basis we've got.

"Wisner, you're an asterite born, and von Raaben has been one for a number of years. But I guess I'll have to spell the facts out for you, Pilot d'Andilly. You're kept like a fighting cock, because that's the only way to attract men to your job. So you aren't aware, I suppose, how thin a margin we asterites live on. Can you imagine what it means to carve a living from airless rocks? Sure, they're rich in metal; atomic power is cheap and solar power is free; but what is there otherwise? Why raid Jupiter at such enormous effort, if we didn't have to have those gases to form the basis of chemical synthesis, of our whole chemical industry, which equals our survival?

"O.K. It's barely possible that three ships working to-

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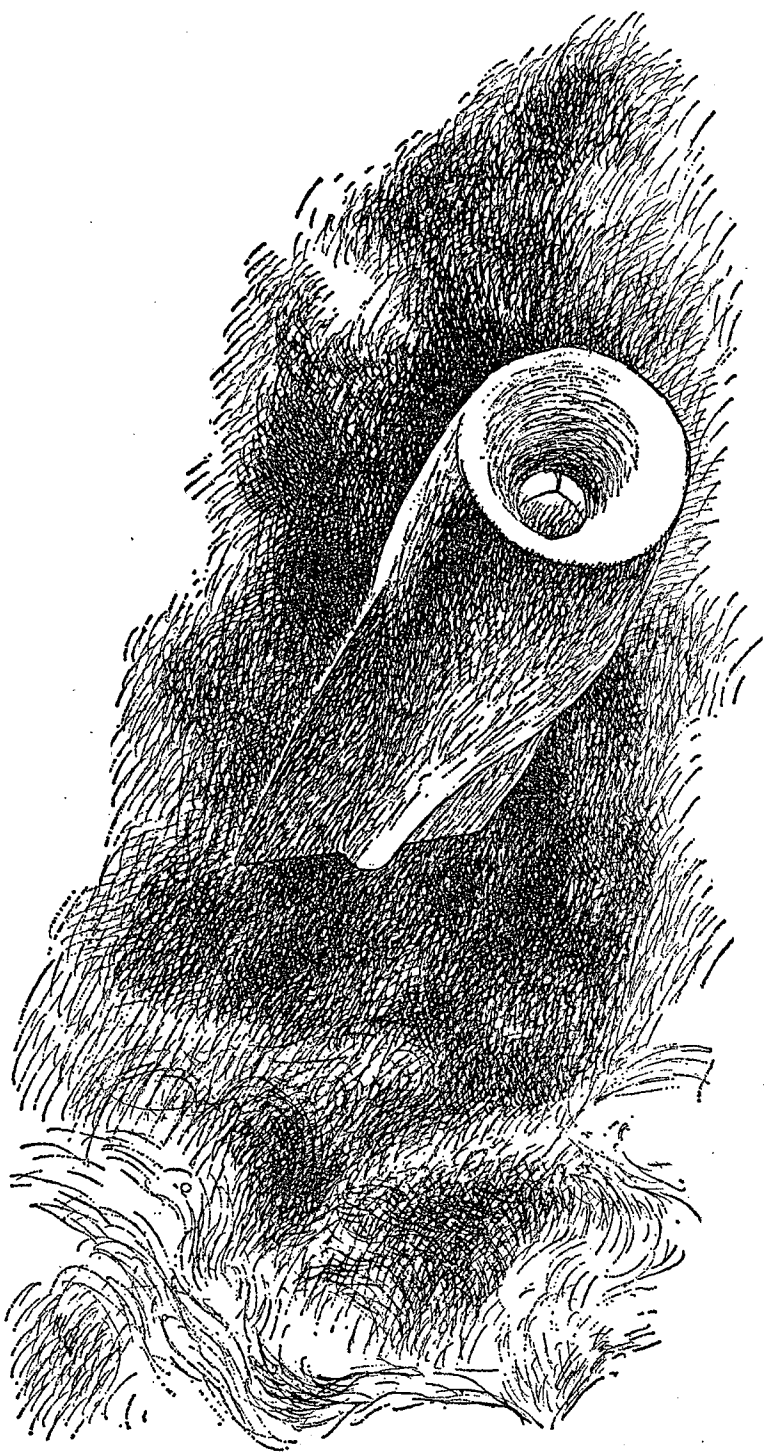

gether could grapple onto Hashimoto's and haul him into clear space. I don't believe they could, but I'll grant a slight possibility. So if you did pull off that stunt, every boy on every asteroid would cheer himself hoarse for you, and every girl would fall into your arms, and every *man* would curse you for a pack of dangerous idiots. Because any operation which consistently gambled at those odds would soon go broke—and we've got to have the operation or the whole Republic dies.

"Now do you understand?"

D'Andilly's look traveled wildly from one pilot to the other. Von Raaben's face had congealed, Wisner's fingers twisted together like snakes. But each of them nodded.

After a time when no one spoke, Pearson turned his head toward Ben Judah. The captain stood unmoving, backed against the bulkhead. "Are we still in contact with Hashimoto?" the manager asked.

"I believe so," Ben Judah said dully.

"Then I suggest you return to the radio room and offer him what consolation you can. If he has a co-religionist aboard—" Pearson had raised his prosthetic hand a little. He let it fall. The clatter was so loud that he jerked in his seat.

"I wonder what happened to conk out Tom's engine?" Wisner muttered.

"We'll never know," the chief engineer said. "That compartment's sealed off behind a rad shield, remember. It's only cracked for direct inspection at refuelling time, every five years or so—Why am I telling you what everybody knows?"

"I'll have nightmares thinking it might happen any time, to me or . . . or anyone."

"Me, I shall have nightmares about Tom," d'Andilly said. "Whirling so utterly helpless, yes, the helplessness is the real horror."

"He did not stop to think we could not get him out of orbit," von Raaben said, "or he might not have bothered."

"Well, we could, if he'd gotten into clear space," Wisner said. "Or, of course, if Jupe's mass didn't produce that kind of orbital speed." His chuckle was without humor. "But then, if Jupe were a minor planet, it wouldn't have an atmosphere worth exploiting, and this would never have happened in the first place."

"If we could slow him somehow," von Raaben floundered. "By aerodynamic braking? No, he has no control surfaces, and with his engine dead—"

D'Andilly sprang to his feet. His chair fell over backwards. "*Mon Dieu!*" he shouted.

"Huh? What?" Startlement ran around the table.

"Control surfaces!" d'Andilly chattered. He waved his arms and forgot to put his torrent of words in English.

"Climb down from the mast, you nut," Wisner exclaimed. "Do you have an idea?"

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"*Oui* . . . yes, yes . . . the balloon, *n'est-ce pas?* Dump the gas out, make a drogue. Ha, quick, draw some plans, *Monsieur l'ingènieur,* time is a-wasteful!"

"You're crazy!" Pearson snapped. He, too, leaped up.

"No, wait," Ben Judah said. Hope kindled in his face. "I do know something about this. The first experimental spacecraft were retrieved in some such way. It might work. And it doesn't look too risky to the men."

"You'd abort this whole cruise," Pearson said. "Not to mention the whopping cost of the balloon. Even getting Hashimoto's vessel back, we'd stick the Company for a terrific net loss."

"Economics can only go so far," Ben Judah said.

"But don't you see?" Pearson's voice turned pleading. "It's not that I'm inhumane. Dollars and cents are nothing but shorthand for resources and human effort. And the Republic has only so much of either to go around. To us, an unprofitable operation is a socially evil one. We've got to operate under economic doctrine!"

"Not every time." Ben Judah's eyes were no longer mild. "If these pilots are willing to go, they shall."

Pearson bit his lip. "All right," he said. "Somebody has to take the blame of all the emotional morons. It may as well be me. I haven't any family to ostracize. So I directly forbid any attempt."

"As captain, I overrule you."

"You can't. This isn't in your province."

"Isn't it?" Ben Judah murmured. His officers, who had crowded close, moved nearer Pearson. The second mate laid a hand on the manager's thin shoulder. "You heard the captain," he said.

Pearson shook himself loose, stumbled back to his chair and buried his face in his hands.

Presently the gang went aft to begin work. Pearson raised his head. The cabin had grown very still again. Only Ben Judah remained, puffing his pipe at the opposite side of the table.

"I'm sorry, Roy," the skipper said.

"I'm sorrier," Pearson told him. "When we reach Ceres, I'm going to prefer charges of incompetence against you."

"Really?"

"Yes. I don't want to. How I don't want to! But we can't keep sentimentalists on the payroll, and we need an object lesson. It's my duty to get you fired." Pearson rubbed his live hand over his plastic jaw. His voice was empty. "What have I got to live for, except my duty?"

The atmosphere of a high-gravity planet has a correspondingly high density gradient. Streaking downward, the scoopships hit perceptibly thick air—still thin even by Martian standards, but thick enough to matter at this speed—almost before the pilots realized they were about to do so. Then it was all their drug-stimulated bodies could do to maintain formation.

There ought to be an art to this, d'Andilly thought amid thunder. Given time, an art could be developed, a whole profession of . . . droguedragging? His teeth gleamed behind his faceplate, a taut and short-lived grin. God grant this was the last as well as the first occasion the thing was tried!

Mignonne reared like a whipped horse. The cable had pulled on her. D'Andilly applied sidewise field thrust. Give that line some slack or it'll yank the guts out of her! But not too much slack, or you'll lose control of the whole crazy package. Then you and your comrades may tumble into Jupiter, ready wrapped in a plastic shroud. Death as a shooting star sounds romantic, but any man of sense prefers to die in bed, at the end of a long and misspent life.

"Whoa, there!" Wisner's voice came to d'Andilly's earphones, barely audible over the interference, the wind, and the cry of tormented metal. "You're pulling on me now."

The Frenchman cast a glance outside. They were still so high that heaven was clear. Stars glittered inhumanly serene and a moon rode in an ice-crystal halo, turning the cloud layers far below into snow mountains. That Jovian horizon stretched further than a man could see, it did not lose itself in curvature but in mists and blacknesses. He saw his companion ships above him, *Sky Thief* to starboard and *Seeadler* to port—himself at the lowest point of an equilateral triangle—as shimmering curves where the light struck them, occulting shadows elsewhere.

The cables trailing aft of the three vessels were harder to see. They'd been smeared with luminous paint; but in this howling, shuddering chaos, one's head slapped back and forth in the helmet—Yes, there. Wisner's line was too taut, von Raaben's too slack. More by feel than brain, d'Andilly decided how he should adjust his own place in the formation.

Mignonne groaned and lurched when he touched the controls. Her Emetts whined, nearly as loudly as the air she split at orbital speed, feeding energy into the drive field. Any change of course under these conditions was like slugging through a brick wall. Sweat stung the pilot's eyes, half blinding him. His tongue was a block of wood and his nose full of his own stink. Vibration quivered his bones. Wind shrieked and hooted. Now and again there came a great flat smack of noise.

But . . . so! He'd completed the shift. The dive proceeded more smoothly.

The balloon snakedanced at the end of the cables. Deflated, slashed open, rolled in a sausage shape and stuffed into a long metal tube, the thing had not been hard to manage in space. But now when they slanted through atmosphere—D'Andilly hoped the plastic wouldn't be damaged. But no, that stuff was intended for spatial conditions. The engineers had needed a laser torch to cut it.

"Tom," he said into his radio, for the dozenth time. "Tom, are you there? Do you read us?"

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We should *be headed to intercept him, according to the last fix the mother ship relayed us. But anything can have happened.* "Tom! Rescue party from *Vesta Castle* calling *Mary Girl.* Come in!"

"He may have passed out," said von Raaben's tiny drowned voice in the earphones. "He may be dead."

"We'll never find him without some kind of signal to home on," Wisner predicted, through teeth clenched against shock waves. "Too big a search field, not enough light to see by."

Everything would have been easier on dayside and at a greater altitude, d'Andilly thought. His mind was buffeted into stupidity, able only to repeat the obvious, over and over. Where the air was thinner than here, less unpredictable variation of windage and density, adequate light, Tom would have been more readily seen as well as rescued. But preparing the drogue had been a maddeningly slow task, when one must stop and plan out every step. The rescuers had arrived very late. Perhaps too late. *Mary Girl* might already have taken the final plunge.

If she wasn't found within the next few minutes, the attempt must be abandoned. They were too near the burnup point. The instrument panel showed outside temperature rapidly rising. Soon the intake scoops would be redly glowing dragon mouths. And soon after that—

"*Hei! Dort!*" von Raaben bellowed. "Eleven o'clock low, see him? There, I say!"

"Jumping Judas, yes," Wisner exclaimed. "I was wrong. We really and truly located him with our own bare eyeballs." Crispness entered his tone. "O.K., Chuck, you still want to be squadron leader?"

"*Mais oui.* Who is better qualified?" D'Andilly had now spotted the distant shape himself. With a pilot's sense of dynamic relationships he gauged how to intercept, and issue his instructions. He knew that he was in fact not superior to his associates. But a single command was essential to co-ordinated effort.

And they would have to do one all-time job of coordination!

The three ships slewed about, fighting for every degree of rotation, and dove on *Mary Girl.* Relative velocities were not great, and they established position quickly. There they flew not far ahead of the wreck, which they surrounded by the tow lines. For a moment, then, a kind of stability prevailed.

"Tom, can you hear me? Come in, Tom," Wisner called.

"Stow the conversation," d'Andilly said. "Are you ready? Let's brake a little . . . back, back, easy does it . . . not so fast, Krauthead . . . raise a bit, Bill . . . ah, we're snagging him."

About halfway between ships and balloon, the three cables were linked by three connecting strands, which in turn supported a flexible metal net. *Mary Girl* was just behind that net. Inchmeal, struggling with a turbulence that threatened to tangle their lines and dash them together, the rescuers allowed the net to move more slowly than the wreck. The scoop nose entered; the mesh snugged close around; the fish was caught.

"Everything seems O.K., true?" d'Andilly said. "*Bien,* let her go."

The hastily adapted hose mechanisms in *Mignonne, Sky Thief,* and *Seeadler* cast loose. The tow lines whipped backward. A radio instruction went to a small package in the balloon's container. It detonated. The metal peeled away. As the furious thrust of air entered its folds, the parachute opened.

D'Andilly brought his staggering ship under control, glanced back, and forgot all else in his awe. High over the stormclouds that looked like white mountains, a transparent hemisphere with a ghostly moon-shimmer across its surface began to bloom. Ever wider it swelled, until d'Andilly thought surely the fabric must rip across and release the shooting star.

But the fabric held. Expanding that elastomer took a great deal of energy, which *Mary Girl* supplied from her velocity. She started to fall more steeply, but at a fast-diminishing rate. Decelerating under power to keep pace, d'Andilly found himself under almost three gravities, besides Jupiter's own pull. Well, that shouldn't be too hard on Tom's body for the short time it must continue.

His live body, one hopes. "Tom, are you there? Do you read us?"

The four ships fled on eastward. They crossed the sunrise line and saw long light, the color of roses, across endless vapor fields. The dwarfed sun climbed higher for them. They descended toward the clouds, until they saw lightning lick its chops.

But by that time nearly their whole speed had been lost. The wreck was parachuting quite gently. It was downright anticlimactic when they closed in on *Mary Girl* and grappled fast. A second radio command ignited thermite cartridges on the cables and burned them loose from the net.

Engines strained skyward. Looking aft, d'Andilly saw the parachute seized by a wind and sent fluttering in the direction of a thunderhead a thousand kilometers tall. *Jupiter wants revenge,* he thought weirdly. *Well, to hell with him. We'll be back.*

After a while, stars crowded a clear darkness. A great silence opened up. The planet seemed no more than some painted backdrop. D'Andilly shook himself gingerly, as if afraid that the bruised flesh would drop off. But no permanent harm seemed done. "Let's go into orbit," he said. His voice sounded odd to him, heard through ears that still tolled. "I want to board and see how Tom is."

He dreaded what he might find.

"Shucks," said Wisner, with a shaken catch of laughter, "I can tell you that. I can see into his cockpit from

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here. He's waving and shaking hands with himself like a lunatic. Nothing wrong with him."

Joy jumped in d'Andilly.

"It must just be that his radio went out," von Raaben said. "With a dead engine he was depending on the emergency accumulators for everything, and I think they must be drained. Come on, let us take a sight and lay a course and get back as fast as possible. I want some beer."

"Beer you shall have," d'Andilly warbled, "all the beer you wish, you foam-at-the-mouth Boche, beer in Jupiter-sized steins until it cataracts from your ears. Provided, of course, that I get as much cognac."

He adjusted thrust vectors according to navigational directions. The three ships and their load moved toward rendezvous. D'Andilly could almost taste the liquor now. He filled his cockpit with hoarsened song.

". . . 'Que donn'rez vous, la belle,
Pour le voir revenir?'
"Auprès de ma blonde
Qu'il fait bon, fait bon, fait bon,
Auprès de ma blonde
Qu'il fait bon dormir!"

The *Vesta Castle* throbbed with energy, accelerating homeward.

Captain Ben Judah wreathed his head in smoke and squinted at a tiny spar. With much care he brought it to the clipper foremast and held it in place a moment until the glue began to set. His inner eye visualized this *Witch of the Waves* as a real thing, soon to be commissioned, to raise her cloud of sails and ride the wind across the world. Gulls wheeled above, no whiter than the wake she cut through infinitely blue water. . . . He sighed. One might as well face facts. Romance had long died out of the universe.

There was diffident knock. He laid down his tweezers and said, "Come in."

Roy Pearson shuffled through. Ben Judah was shocked at the man's drawn appearance. "Hello, there! What the blazes have you had afoot?" he asked, as heartily as he was able. "Taking your meals in your cabin like that, the past half dozen watches. If I hadn't been so busy getting us under weigh, I'd have come to see what ailed you."

"Oh, save it." Pearson lowered himself to the edge of the bunk and stared between his knees at the deck. His voice was hardly audible. "You know why I kept out of sight."

"Come, now. Nobody's angry at you for giving advice that turned out to be mistaken. You should know your pilots better than that. They might crow a little, as they well deserve to, but nobody that extroverted can nurse a grudge. Even Tom Hashimoto remarked at mess, when he'd heard the story, that in your place he'd have done exactly as you did."

"It isn't that." The voice grew louder, saw-edged. "It's you. I thought I could be smug about filing my complaint. But it's no use, I can't be." Pearson achieved an upward glance. "But I'm still going to do so," he said. "I've got to. If we don't stand by doctrine, how many other young men will die, or be crippled?"

"Well, for everything's sake!" Ben Judah broke into laughter. "Is that what was eating you? Roy, Roy, we need you for comic relief. Haven't you heard the C.E.'s report on the salvaged vessel?"

"N-no. What—" Pearson tried to rise, but his legs wouldn't obey.

"He made a cursory inspection, and found immediately what had caused the trouble. In the engine, of course. Sulfuric acid fumes had corroded the cross-linkages between reactor and geegee generator."

"Where in confusion did it come from?"

"That's clear, too. There have been similar incidents in the past, Mac tells me, involving other kinds of machinery. You see, steel is usually pickled in sulfuric acid, and some of the acid seeps in, gets right in between the crystals. Then, in a sealed environment like that engine compartment, and under the encouragement of nuclear radiation and stray field-drive impulses . . . the acid leaks out again. Very, very slowly, but it does. Precautions had been taken against that type of thing, but evidently they weren't thorough enough. You recall *Mary Girl* is one of the oldest scoopships in service. She'd had a long time for the effects to accumulate."

"But this means—" Pearson's brain began to click in accustomed patterns. "Yes, it shouldn't be hard to deal with. Install pH meters, or something of the sort, to give warning."

"I thought of that, too," Ben Judah said. "Hindsight is always so much sharper than foresight, isn't it? O.K. Suppose I had not countermanded your orders and we had not gotten that ship back. How many more would have been lost before the cause was found?"

Pearson stared at him. "That's right."

"Therefore my decision resulted in a net profit for the Company, or at least in avoiding a serious net loss. So your duty is to give me the highest commendation and nominate me for a raise in pay."

Pearson sprang clumsily to his feet and extended a hand that quivered. Tears touched his eyelids. "You can bet I'll do that, Eli!"

"Now, now," rumbled Ben Judah, embarrassed. "No need to make a fuss. Relax. Have a drink."

Before long, Pearson had recovered enough self-possession to suggest a game of chess. ◻

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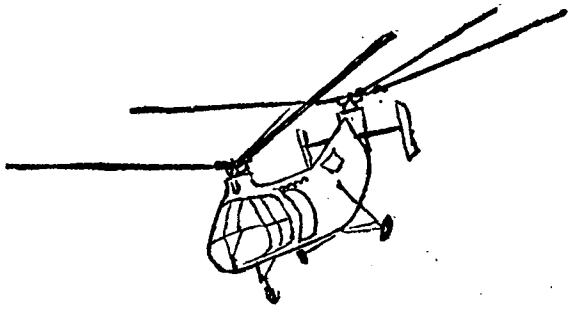


SONNY

Of course, no one actually knows the power of a thought. That is, the milli — or megawatts type of power . . .

by RICK RAPHAEL

ILLUSTRATED BY JOHN SCHOENHERR

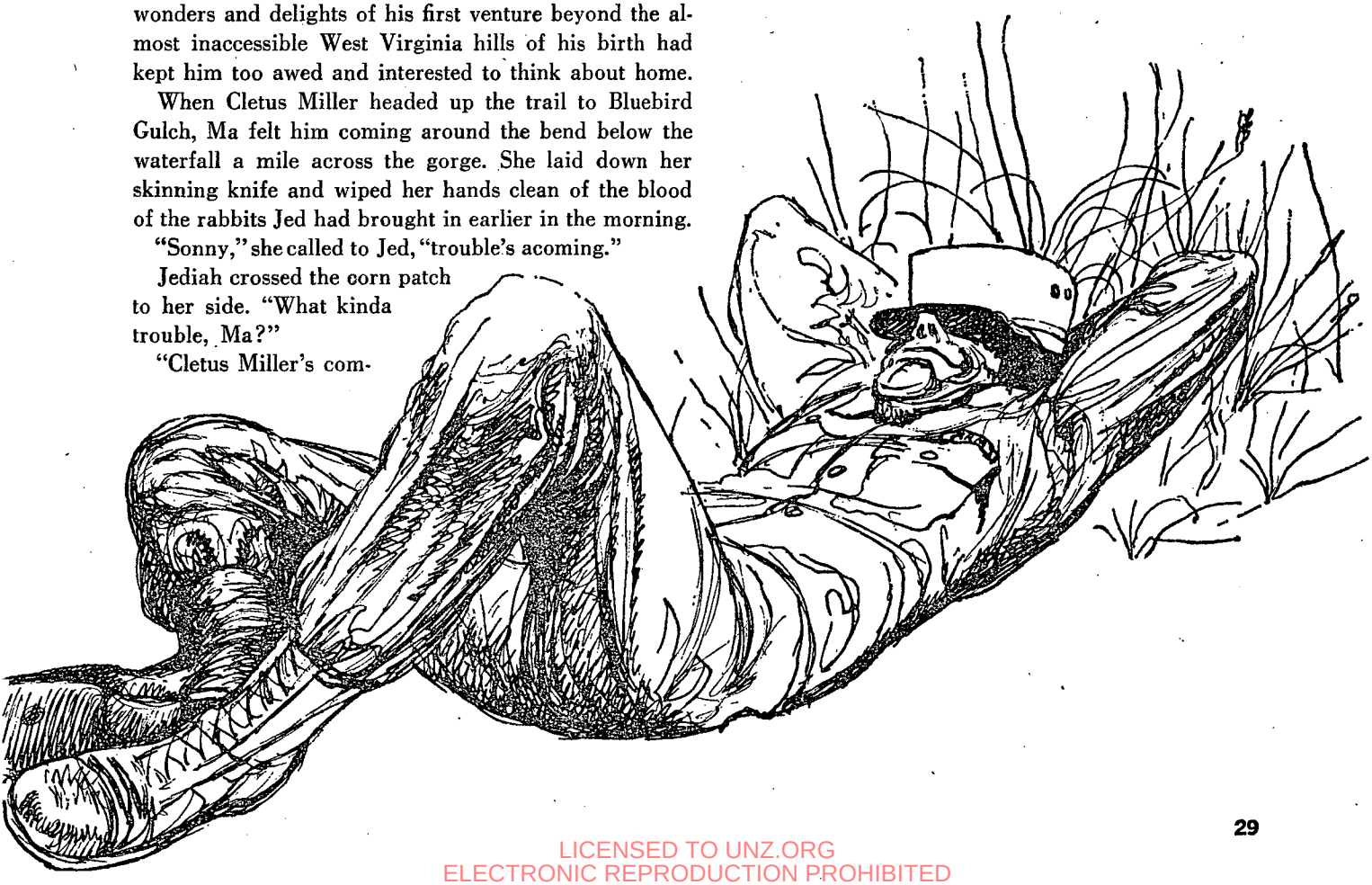
Private Jediah Cromwell was homesick for the first time since his induction into the Army. If he had gotten homesick on any of at least a dozen other occasions during his first two weeks in the service, he might never have gotten beyond the induction center. But the wonders and delights of his first venture beyond the almost inaccessible West Virginia hills of his birth had kept him too awed and interested to think about home.

When Cletus Miller headed up the trail to Bluebird Gulch, Ma felt him coming around the bend below the waterfall a mile across the gorge. She laid down her skinning knife and wiped her hands clean of the blood of the rabbits Jed had brought in earlier in the morning.

"Sonny," she called to Jed, "trouble's acoming."

Jediah crossed the corn patch to her side. "What kinda trouble, Ma?"

"Cletus Miller's com-



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in'," Ma Cromwell said. "He ain't been up here since the week afore your Pa died. I don't know what it is but it's bound to be trouble."

A few minutes later Miller hallooed from the bottom of the garden patch, then trudged up to the cabin.

"Set and rest, Cletus," Ma said. "Sonny, fetch Cletus a coolin' dip." Jed ambled down to the spring sluice and dippered out a pint of clear, mountain water.

"Got mail fer you," Cletus said, waving an envelope. "Guvermint mail. Fer Sonny."

Two weeks later, Jediah swung down the mountain to Owl Creek, carrying a small sack with his good clothes and shoes in it. The draft notice was stuffed into his overall pockets along with biscuits and meat Ma had insisted he take.

"Go along now, Sonny," she had directed him, "and don't you fret none about me. The corn's 'most ready. You got a good supply of firewood in, more'n enought to last me all winter. If your guvermint needs us Cromwells to fight, then I reckon its our bounden duty. Your grandsire and greatgrandsire both wuz soldiers and if'n your Pa hadn't gone and gotten his leg busted and twisted afore the guvermint called him I reckon he'd have been one, too. I've learned you all I can and you can read 'n write 'n do sums. Just mind your manners and come on home when they don't need you no more."

In Owl Creek the first real part of the excitement hit Jed. He had been as far as Paulsburg, twenty miles farther and that was almost as big as the county seat at Madison. Now he was going to go even beyond Madison —right to the city. And then maybe the Army would send him more places.

The Army did.

Everything had been wonderful, almost overwhelming, from the moment he boarded a bus for the first time in his life until he arrived at Fort McGruder. He could hardly believe the wealth of the government in issuing him so many clothes and giving him so much personal gear. And while the food wasn't what Ma would have cooked, there was lots of it. He liked the other recruits who had ridden down to McGruder with him, even though a couple of the city fellows had been kind of teasing.

He liked the barracks although his bunk mattress wasn't as soft as Ma's eiderdown comforts. He liked everything—until the sergeant had cussed at him this afternoon.

Now Jed lay on his bunk and counted the springs on the upper bunk occupied by Private Harry Fisher. It was close to eight o'clock and the barracks were full of scores of young soldiers. A crap game was going on three bunks away and across the aisle; another country boy was picking at a guitar. The bunk above sagged with the weight of Harry Fisher, who was reading a book.

Jed's mind kept coming back to the cussin' out he had gotten, just for not knowing the Army insisted on a body wearing shoes no matter what he was doing. Jed had never been cussed at before in his entire life. True, Ma never hesitated about taking a willow switch to him when he was a young 'un, or a stob of kindling when he got older. But she always whupped him in a gentle fashion, never losing her temper and always explaining with each whistling swing of switch or club, just what he'd done wrong and why this was for the good of his immortal soul.

Thinking about Ma, Jed got homesick. He closed his eyes and looked around for Ma. She was stirring a pot of lye ashes over the fireplace and when she felt Jed in the cabin she closed her eyes. "Sonny," she said, "you in trouble?"

Lying on his bunk at Fort McGruder, Jed smiled happily and thought back an answer. "Nope, Ma. Jest got to wonderin' what you wuz doing."

Whatever Ma was going to say was lost amid the yells and growls of the men in the barracks as the electricity went off. "Who turned the lights off?" Fisher cried from the top bunk. "It's not 'lights out' time yet."

The noise jerked Jed back to the present and his eyes opened. The lights came on.

"Where are the dice," one of the crapshooters barked. "I rolled a seven just when the lights went out."

The noise died down and the game resumed. Fisher lay back on his bunk and went back to his book. Jed's mind reached out for home again. "Ma," he called out, "you say something?"

The lights went out and the yells went up throughout the two-story barracks.

Jed opened his eyes and the lights came on.

At the end of the barracks, Corporal Weisbaum came out of his sacredly private room and surveyed the recruits. "Awright," he roared, "so which one of you is the wise guy making with the lights?"

"So nobody, corporal," a recruit sitting on the end bunk answered. "So the lights went out. Then they come back on. So who knows? Maybe the Army ain't paying its light bills. I had a landlady back in Brooklyn who usta do the same thing anytime I got late with her rent mon . . ."

"Shaddup," Weisbaum snarled. "Maybe it was power trouble. But if it happens again and I find out one of you monkeys is bein' smart, the whole platoon falls out and we'll get a little night air exercising." He stalked back into his room and slammed the door.

The barracks buzzed angrily for a few moments. Jed sat up and peered up at Fisher.

"That there officer shorely don't talk very nice, you know that Harry," Jed said.

Fisher laid down the book and peered under his thick-rimmed glasses at the lanky mountain boy.

"How old are you, Jed," he asked.

"Nineteen."

"Lived up in the hills all those years?" Fisher inquired.

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"Yup," Jed replied. "This is the furthinest I've ever been." His normally cheerful face fell slightly. "Kinda makes me lonesome in a way, though. Folks back home jest plain don't talk thataway one to the other."

Fisher leaned over the edge of his bunk. "Let me tell you something, Jed. Don't let talk like that worry you. First of all, he's no officer. And second, he doesn't really mean it and it's just a way the Army has of making men of us. You'll hear lots more and lots worse before you get back to those West Virginia hills of yours."

Jed lay back down on the bunk. "Mebbo so," he admitted. "Don't mean I gotta like it much, though. Ma never talked thataway to me, no matter how bad a thing I done."

Jed closed his eyes and thought of home. Ought to say goodnight to Ma. He let his mind reach out to the cabin almost two states distant.

The lights went out in the barracks, two of the crapshooters started swinging at each other in the dark and the commotion drifted upwind to the platoon sergeant's room in another barracks two buildings away.

In the confused yells and the shouting of Corporal Weisbaum, Jed gave up trying to say goodnight to Ma and opened his eyes again.

The lights in the barracks came back on just as Platoon Sergeant Mitchell walked in the front door.

The two crapshooters were tangled in a heap in the center aisle of the barracks, still swinging. Corporal Weisbaum had the Brooklyn recruit by the front of his T-shirt, waving a massive fist under the boy's nose.

"AT EASE!" Mitchell boomed. The barracks shook and suddenly there was quiet. "Now just what is going on here?" he demanded.

Weisbaum released his grip on the recruit and the two brawlers scrambled to their feet. The corporal glared at the forty-odd recruits in the barracks. "I warned you mush heads what would happen the next time one of you fiddled with them lights. Now I'm gonna give you just five minutes to fall out in front in fatigues and combat boots. MOVE!"

"Lay off," one of the recruits muttered, "nobody touched the lights. They just went off."

Weisbaum turned a cold stare on the youngster. "Just went out, eh? O.K. Let's see. Sergeant Mitchell, did the lights go out in your building?"

The sergeant shook his head.

"Did you notice if the lights were out in any other buildings when you came up?" Again Mitchell shook his head.

"Just this barracks, huh?"

Mitchell nodded.

There was a moment of silence. "Five minutes, you jugheads," Weisbaum roared. "Five minutes or I'll have your flabby hides hung like wallpaper in my room."

By the time the platoon got back in the barracks after a five-mile walk around the perimeter of the post, Taps were sounding and the lights went out as soon as the men hit their bunks. The talking was over. Jed felt better after the pleasant walk in the night air. He decided Ma would be asleep anyway by this time. He turned his head into his pillow and was snoring in ten seconds.

Once Jed began getting the feel of what was wanted of him, his training improved and the wrath of the platoon sergeants and corporals was directed elsewhere. The recruits moved rapidly through the hardening period and with each day, Jed found the going easier. By the time the platoon was ready for the rifle range, Jed hadn't had time to give more than a brief occasional thought about home.

When the supply sergeant issued him his M-14 rifle, Jed carried it back to the barracks like a young bridegroom carrying his beloved across their first threshold.

"Harry," he said in an awed voice to his bunkmate, "ain't that jest about the most bee-ootiful thing you ever did see?"

Fisher was sitting on the lower bunk beside Jed, working the action on his own rifle. "It's a lovely weapon, allright. I just hope I can hit the side of a barn with it."

"Hit a barn with it," Jed said in amazement, "why, Harry, with this here gun I could hit a squirrel in the eye two ridges away and let you pick which eye."

Fisher grinned. "I've heard you mountain boys are pretty good with a rifle. We'll see just how good you are next week when we go out on the range."

The following Monday morning on the range, the platoon gathered around Corporal Weisbaum.

"Awright, you bums," the corporal sneered, "here's where we separate the men from the boys. Don't let the noise shake you too bad and if it kicks you in the shoulder a little, don't flinch. Remember what you learned in dry fire practice—hold 'em and squeeze 'em off. This is just familiarization fire, so don't worry if you don't hit the first few shots."

He gestured. "Awright. First order on the firing line."

Twenty men of the platoon, Jed included, moved up the embankment to the firing positions. Two hundred yards away the big targets were lined up like billboards along the line of pits.

From the range control tower in the middle of the firing line, the bullhorn speakers blared. "Familiarization fire. Prone position." Twenty riflemen dropped to their knees and then forward onto their bellies, their cheeks cuddling the stocks of the rifles.

"Twenty rounds. With ball ammunition, load and lock." Twenty bolts snapped shut.

"Ready on the right? Ready on the left?"

The flank safety officers signaled. "Ready on the firing line," the speakers blared. "Commence firing."

Jed squinted down the sights and carefully squeezed off a shot. A ragged volley followed down the line. Jed was in position Number Eighteen and down range, his target atop a large painted sign bearing the same number, dropped. Jed rolled over and yelled at Corporal

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Weisbaum. "Hey, corporal. I must have done shot 'n broke that there target. It just fell down."

Weisbaum grinned. "You didn't break nothing, hillbilly. You just got lucky and hit somewhere on the target. Every time you hit it, they pull it down and mark where your shot hit so you can correct your sights. See, here it comes back up again."

Target Number Eighteen rose above the pits. In the dead center of the small black bull's-eye was a small white dot. Weisbaum stared at the target, then swung a pair of binoculars to his eyes. "Man, talk about luck. You hit it smack in the center of the black."

The target dropped again for a pasted patch over the hole. Then it came up.

Jed grinned happily and rolled back to the prone position, looked briefly down the sight and squeezed off another round. The target dropped again. In a moment it was back up, the same white marker disk showing in the black. Weisbaum put the glasses to his eyes again. "I knew it was luck. You musta missed it, hillbilly, cause that's the same mark you had last shot."

Jed frowned and waited for the target to be pulled and pasted, then fired again. Once more it came up with the identical white marker in the center. It was Weisbaum's turn to frown. "Better check that sight, Cromwell. You can't shoot on luck forever. Them last two rounds never touched the target."

The range radio safety operator came up to the corporal and handed him the walkie talkie. "Pit wants to talk to you, corporal."

Weisbaum took the handset and held it to his ear. "This is Corporal Weisbaum. Yeah. He WHAT! You sure? Yeah, pull it and paste it. This I want to see."

He handed the handset to the radioman and glared at Jed. "So now you're some kinda wise guy, huh, hillbilly? You think you can keep shootin' on luck? The pits say you been hitting the same spot every time. Nobody can do that. Now, go ahead, hillbilly. I want to see you do it again."

Jed rolled over on his belly, looked and fired. Down went the target to come up again with another dead-center marker.

"He did it again," the radioman declared to the corporal.

Weisbaum was beginning to get an awed look on his face. "Go on, hillbilly, keep firing."

Behind the corporal and the recruit, the radioman was talking softly to the pits. "He's in position . . . he's aiming . . . he's holdin—" The operator stopped talking and shook his handset and held it again to his ear. Jed fired. A split second later the radio burst into voice. ". . . Did it again," the pit operator yelled excitedly.

Jed fired all twenty rounds into the exact same hole and the range firing came to a screeching halt. By the time he was on the final round, all other firing had stopped and range officers and safety NCO's were gathered in a semicircle around the prone mountain boy.

Weisbaum pounded Jed on the back as the young recruit scrambled to his feet and dusted his fatigues. "Man, what an eye. Wait 'til the old man sees this. Look," he took Jed by the arm, "you shoot like this all the time back in them hills you come from?" Jed nodded. "I thought so," Weisbaum cried happily. "Go sit down and take it easy. I want the old man to come out and see this."

Jed smiled happily and walked off the firing line amidst the admiring stares of his fellow recruits. He flung himself on the ground in the shade of a stack of ammunition boxes and grinned to himself. Shucks, all that excitement over a little shooting. Back home he did it all the time. But it'd make Ma proud to know he could do something real good. He let his mind travel for the first time in weeks.

On the range road a few feet away, a convoy of trucks carrying another recruit company to the ranges farther down the line, suddenly spluttered and came to a stop as their engines, died.

"Ma," Jed thought, "you busy?"

Behind the cabin in Bluebird Gulch, Ma Cromwell laid down the axe she had been splitting firewood with and closed her eyes. " 'Bout time you remembered your maw," she replied. "You all right, Sonny?"

"I'm jest fine, Ma. An' I did somethin' good, too, Ma. I just showed these Army fellers what us Cromwells kin do with a rifle gun."

Jed lay in the warm sun and let the light filter through his closed eyelids. He paid no attention to the clanging of truck hoods and the muttered curses of a half dozen truck drivers as they clambered over the front of their vehicles trying to figure out what was causing them to have engine trouble.

"What did you do, Sonny?" Ma asked.

"Tweren't really nothing, Ma," Jed replied. "I shot this here newfangled gun they gave me at a big ol' target 'n hit it, Ma. Honest, Ma, that black circle they got in that thing is jest 'bout as big as the hind end of a black bear and it ain't no further away than the bottom of the cornfield from the cabin door."

In the range control tower, Corporal Weisbaum was getting madder every second.

"What's the matter with that switchboard operator," he screamed. "Don't he hear the buzzer?" He shook the phone and roared again. Finally, he slapped it down on the hook. "Gimme that radio," he said, reaching for the handset. The radio operator shook his head sadly. "No use, corp. It's deader'n doornail. Don't know what's the matter. It just quit."

Weisbaum looked around and spotted one of the regular jeep drivers standing at the foot of the tower. "Mahoney," he yelled. "Get in your jeep and go back and get the old man. Tell him he's gotta see Cromwell shoot. You can tell him what happened."

The jeep driver started towards his vehicle. "And Ma-

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honey," Weisbaum yelled after him, "while you're there, bring back another radio and tell that idiot on the switchboard we got wire trouble." Mahoney nodded and went to his jeep.

Back at the cabin, Ma Cromwell wiped her face with her apron skirt. "Shore hot today," she thought. "You hot there, too, Sonny?"

"Kinda hot, Ma," Jed thought back. "Shore ain't like home. Not bad though."

"You gettin' enough to eat, child?" Ma asked.

Jed frowned slightly and stepped up his mental output. A half mile down range and a thousand feet up, an Army helicopter heading for a maneuver area, coughed and quit. The blades went into autogyro as it sank quickly to earth.

Vehicles all over the post came to a spluttering stop and office lights and refrigerators went off.

"What did you say, Ma?" Jed asked. "Seemed like you got sorta weak."

" 'Tain't me," Ma snorted. "Jest that nosy Miz Hawkins. She's gotta listen in on everybody's private talk up in these hills, seems like." There was the feeling of an indignant gasp and then Ma's thoughts came booming through. Jed relaxed and grinned. The chopper was almost on the ground when its engine caught fire once again and went surging up and forward. The surprised pilot fought to get control before he slammed into a low hill. Lights came back on and electrical equipment began running other than close to the range.

"Shouldn't ought to talk like that, Ma," Jed grinned. "She's jest bein' friendly like."

"Hm-m-m," Ma sniffed, "gettin' so's a body cain't even talk with her own kinfolk without everybody in these parts listenin' in."

Mahoney got out of his jeep and walked back to the tower. "Jeep won't start," he called up to Weisbaum.

The corporal turned purple and leaned over the edge of the tower. "Ta hell with it then," he roared. "Now get those bums back on the line. We got a whole platoon to shoot out and I want to see that hillbilly do the same thing in the standing position.

"Cromwell," he bellowed, "get up on that line."

Jed opened his eyes quickly and then shut them for another moment.

"Got to go, Ma," he thought quickly, "that corporal feller's yellin' again. You take care, Ma."

"I will, Sonny," Ma thought back. "Mind your manners."

Jed got up and hurried to the firing line. In the tower, the phone began ringing and the radio and telephone operators began reporting the equipment trouble they'd been having. On the road, one of the truck drivers half-heartedly stepped on the starter for the tenth time. The engine roared to life. The other drivers stopped and stared, then climbed down from fenders and front bumpers and tried their own starters. The trucks and their puzzled drivers left. Firing resumed.

That evening in the barracks, Harry Fisher complimented the mountain boy. "Nice shooting today, Jed," he said, "I was on the radio in the pits while you were shooting. I don't think anyone ever saw anything like that before."

Jed smiled at his friend and bunkmate. "It's easy to do, real easy Harry," he said. "I reckon everyone could do it once they get the hang of it."

Fisher smiled ruefully. "You're looking at one guy who'll never get the hang of it," he said, "whatever the 'hang of it' might be."

"Honest, Harry," Jed said earnestly, "all you gotta do is jest think them bullets into that big black spot."

Fisher laughed. "I could think like Socrates and never come close to . . ." He stopped and stared at Jed with a half-smile. "You know, Jed, you're kind of weird sometimes. 'Think the bullets.' Come to think of it, though, that's not the only weird thing. Did you know that everytime you were getting ready to shoot our radios went dead today?"

Jed frowned thoughtfully. "That's funny. I ain't never heard of that happenin' afore. O' course, we never had radios in Bluebird Gulch. Only thing we ever had trouble with wuz the 'lectric light bulbs in Paulsburg the one-two times our folks went down there. Seems like them lights wuz goin' out everytime one of us wuz mind-talkin' with some homefolks."

Harry stared puzzledly at the mountain boy.

"You know," Jed tried to explain, "like when you might of fergot somethin' someone wanted real bad from the store. Or mebbe like one time when Ma'n me wuz in the big store in Paulsburg and she wuz gettin' some fancy cloth fer Miz Culpepper. Store didn't have no fancy cloth like Miz Culpepper wanted, with big red flowers. Only had blue flowers. So Ma, she mind-asked Miz Culpepper if the blue ones would be all right. Every durned 'lectric light bulb in that store went out."

Fisher was beginning to get a dazed look on his face. " 'Mind-asked.' 'Mind-talk.' You mean what I think you mean, Jediah?" he asked.

"Reckon I do," Jed said emphatically. "Just like I mind-talked with Ma this afternoon an' tole her what all the hurrah was about jest 'cause I flang them bullets through that big ol' black spot."

"You talked with your mother back in West Virginia this afternoon?" Harry pressed. "From the rifle range?"

"Shore did," Jed said happily. "Most plumb forgot fer a couple o' weeks now, what with us bein' so consarned busy. It wuz purely fine to talk with Ma."

Fisher's brain was spinning. "Can you contact her anytime you want to?"

"Shore kin," Jed said proudly. "It takes a mite more power though, the furthern I git from home. Or if Miz Hawkins is listenin' in."

"Let's see you do it now," Fisher demanded.

Jed shut his eyes. "Ma," he thought, "you got time fer a chat?"

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The lights went out all over the barracks. Harry Fisher fainted.

When he came to, he was lying on Jed's bunk with the mountain boy leaning over him solicitously. "You all right, Harry?" Jed asked anxiously. "Ma's worried 'bout you."

Harry fainted again.

When he came to the second time, Jed had gone running down the barracks aisle to Corporal Weisbaum's room. Harry sat up and swung his feet over the edge of the bunk. He was light-headed and his brain was still whirling.

A minute later Jed came back leading Weisbaum. The corporal peered down at Fisher. "You sick 'er somethin' Fisher?" he asked. "Get too much sun today?"

Harry shook his head. "No. I'm O.K. now, corporal. Must have been something I ate. I'll be all right."

Weisbaum reached down and felt Harry's forehead. "You look kinda peaked to me. You hit the sack and if you don't feel O.K. in the morning, I'll put you on sick call."

Harry shook his head again. "No need for that. I'll be all right. I'm going outside and get some fresh air. Jed, will you give me a hand, please?"

He stood up shakily and Jed took his arm. "O.K.," Weisbaum said, "but if you don't feel so good, you're going to the dispensary, you hear." He went back to his room.

Harry and Jed walked out of the barracks into the night air. Fisher paused and breathed deeply, then turned to face Jed. "You always been able to mind-talk with your mother?" he asked.

"Why, shore," Jed replied. "Most folks back home kin. Shore saves a heap o' walkin' over them hills."

"And did the lights go out when you talked that way?" Harry inquired.

"Well now, I don't rightly know," Jed said. "Only place what has them lights close by is Paulsburg and that's thutty miles from Owl Creek and us folks ain't got much truck fer them big cities. Don't reckon any of us ever been there more 'n three-four times in our whole lives. But it shore happens in Paulsburg whenever we gossip thataway. Never thought nothin' of it afore, though. Reckon, now that I study on it a mite, it's 'cause we got to use more of the power to reach across them hills. Ma once said she reckoned us Cromwells could mind-talk with the Empereer of all Roosha if'n we had to. 'Course, we'd be straining our heads a mite fer all that distance 'cause Ma says Roosha and England is a heap further from Bluebird Gulch 'n even Madison. Or Fort McGruder, I reckon."

Harry thought quietly for a moment.

"When was the last time you talked with your mother that way?" he asked.

"Don't rightly know or remember jest when it wuz," Jed replied. "Seems like it wuz 'bout the fust week we wuz here. One night, in the barracks. I kinda got homesick I reckon, 'cause that wuz the day I got cussed out for the first time in my whole, entire life."

Harry smacked his clenched fist into his hand. "That's it," he cried. "That's it. That was the night the lights went out three times in the barracks. The night Weisbaum made us take that five-mile moonlight hike because he thought someone was fooling with the lights."

He grabbed Jed by the arm. "That was the night, wasn't it, Jed?"

"Come to think of it," Jed replied, "I reckon it wuz. There wuz such a hurrah when the lights kep a-goin' out, I never did get to hear what Ma had to say. 'N by the time we got back from that little walk, I plumb fergot to ask her.

"You know somethin' Harry, I plumb fergot what would happen to them lights. By gosh, I reckon I wuz the one what got us all in trouble. I jest reckon I better go 'n tell the fellers I'm sorry 'bout that."

Fisher grabbed his sleeve. "Oh no you don't," he snapped. "You're coming with me."

Ten minutes later, two slightly scared recruits stood on the steps leading to the post commander's quarters. Jed started back down the steps. Harry held tightly to his arm. "Come on," he whispered savagely, "we're going to talk with the colonel, Jed. Now don't you go getting chicken on me, you hear."

"Harry, I ain't never even see'd no colonel, much less 'n talk to one," Jed said, "and I reckon I jest as soon not, if'n you don't mind."

"I do mind," Harry snapped and pulled Jed up to the door.

Their ring was answered by a pretty, teenaged girl. She smiled inquiringly at the two young soldiers.

"Miss," Harry stammered, "we'd like to talk with Colonel Cartwright, please."

The girl turned into the house. "Dad," she called, "someone to see you."

Colonel William Cartwright came to the door. The light from the room glinted off the silver eagle on his collar. He looked at the two young soldiers. "What can I do for you men?" he asked.

"Sir," Harry answered with a stiff salute and a quavering voice, "I'm Private Harry Fisher and this is Private Jediah Cromwell, sir."

The colonel returned the salute. "All right, at ease. What do you want?"

Harry gulped and took a firm grip on his courage. "Sir," he barked out, "are your house lights all in good working order?"

"What?" Cartwright exploded. "What the devil are you talking about, soldier?"

"Sir, we've got to show you something right now," Harry stammered. "It's urgent, colonel."

"Now see here Fisher," the colonel said, "we've got proper channels for any problems you might have and I don't take care of those things at my quarters. I have

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an office in post headquarters and with the permission of your company commander, you can see my adjutant during duty hours. Or the chaplain."

"Please, sir," Harry gulped. "It's awfully important."

"Well," the colonel hesitated, "this is most unusual."

"Yes, sir, it is most unusual," Harry agreed.

"All right," the post commander sighed, "what is it?"

"Sir, are your house lights all working?" Harry repeated.

"Now look here, Fisher, if this is some sort of a gag, I'll see that . . ."

"No, sir," Harry repeated strenuously, "I really mean the question."

The colonel glanced back over his shoulder into the house. He turned back to the pair. "Yes, the lights appear to be all functioning."

Harry turned to Jed. "Talk to your mother, Jed," he whispered.

Jed shut his eyes. "Ma," he thought, "it's me agin!"

The lights went out all over the colonel's quarters.

Colonel Cartwright gasped and stared at the mountain boy standing with his eyes closed.

"All right, Jed," Harry said, "break it off."

"Jest a minute, Ma," Jed thought, "Harry wants me." He opened his eyes and the lights came on.

"How did he do it?" the colonel breathed.

"He thought them out, sir," Harry said.

"He . . . WHAT?" Cartwright spluttered.

"That's right, sir," Harry repeated. "He 'thought' them out. Jed, get Ma on the line again."

Jed shut his eyes. The lights went out again.

Colonel Cartwright sagged against the door jam. He moaned, "How long has this one been running around loose?"

"Colonel," Harry said cautiously, "he does the same thing with radios, telephones, cars, anything requiring electrical power. He just shuts it off."

The post commander looked stunned.

"That's not all either, sir," Harry continued. "He can 'think' bullets to a target."

"Come in the house," the colonel said weakly. "That's an order, soldiers."

Three weeks later, Sergeants First Class Harold Fisher and Jediah Cromwell were putting the finishing touches to their own private room. Jed sank down onto the soft mattress on the big bed. "Glory be, Harry, I jest can't seem to catch my breath, we've been movin' so fast 'n doin' so much. All them there tests with them tanks and them airyplanes in Californy and that other funny place. Ma thought it wuz kinda funny I had so much time fer jest a-sittin' 'n chattin' with her. Now we're here 'n I ain't allowed to say nothing to her.

He stole a proud glance at the new chevrons on the sleeve of his fancy, blue dress uniform. "Gosh but Ma would be proud to hear about all what's happened to us. I purely wish I could tell her."

Harry snapped up from the bureau drawer where he had been placing his clothing.

"Watch it, Jed. You know what the general said. Now don't you go and queer this deal for us just because you're getting a little homesick," Harry warned. "We're the only Army GI's in this outfit and this is pretty plush. You know what the general said, 'no talking with Ma until you get permission.' Remember?"

Jed sighed. "Oh, I remember, rightly enough. Only I shore wish they'd let me just think 'hello' to her. I ain't never been so far from her afore and its gonna take a heap of powerful mind-talk to get to her."

"Never you mind, now Jed," Harry said, "you'll get all the chances you want to talk with her. Just be patient."

He turned back to his clothing. There was a knock at the door and then it opened to admit a small, conservatively-dressed civilian. Both sergeants jumped to their feet.

"Good morning, gentlemen," the civilian said. "I'm George Wadsworth, first secretary at the Embassy here." He looked around the room and smiled. "Your quarters satisfactory, men?" Both soldiers nodded happily.

"Good," Wadsworth said. "Oh, by the way Sergeant Cromwell," he turned to Jed, "we've just learned that our hosts plan to launch their manned Moon rocket within the next hour or so. Isn't that interesting?"

Jed nodded vigorously.

"I thought so, too," Wadsworth continued. "I should imagine that your mother would find this quite interesting as well, don't you think, Sergeant Cromwell?"

" 'Deed she would, sir," Jed said enthusiastically.

"Quite so," Wadsworth said mildly. "Why don't you just take the rest of the day off and tell her all about it. While you're at it, you might bring her up to date on your trip. And there's a wonderful view of the Kremlin from this window. I'm sure she'll be interested in all this. Just have a nice long chat. Take all day. Take two days if you like. No hurry, you know."

He smiled and turned to leave the room. "Don't forget to tell her about your airplane ride, too," he added and then walked to the door.

"Thank you, sir," Jed called out after him.

Jed grinned happily and lay down on the nice, soft mattress.

"Ma," he thought, concentrating harder than he ever did before, "it's me agin."

All electrical power went off over the western dominions of the Union of Soviet Socialist Republics. ■

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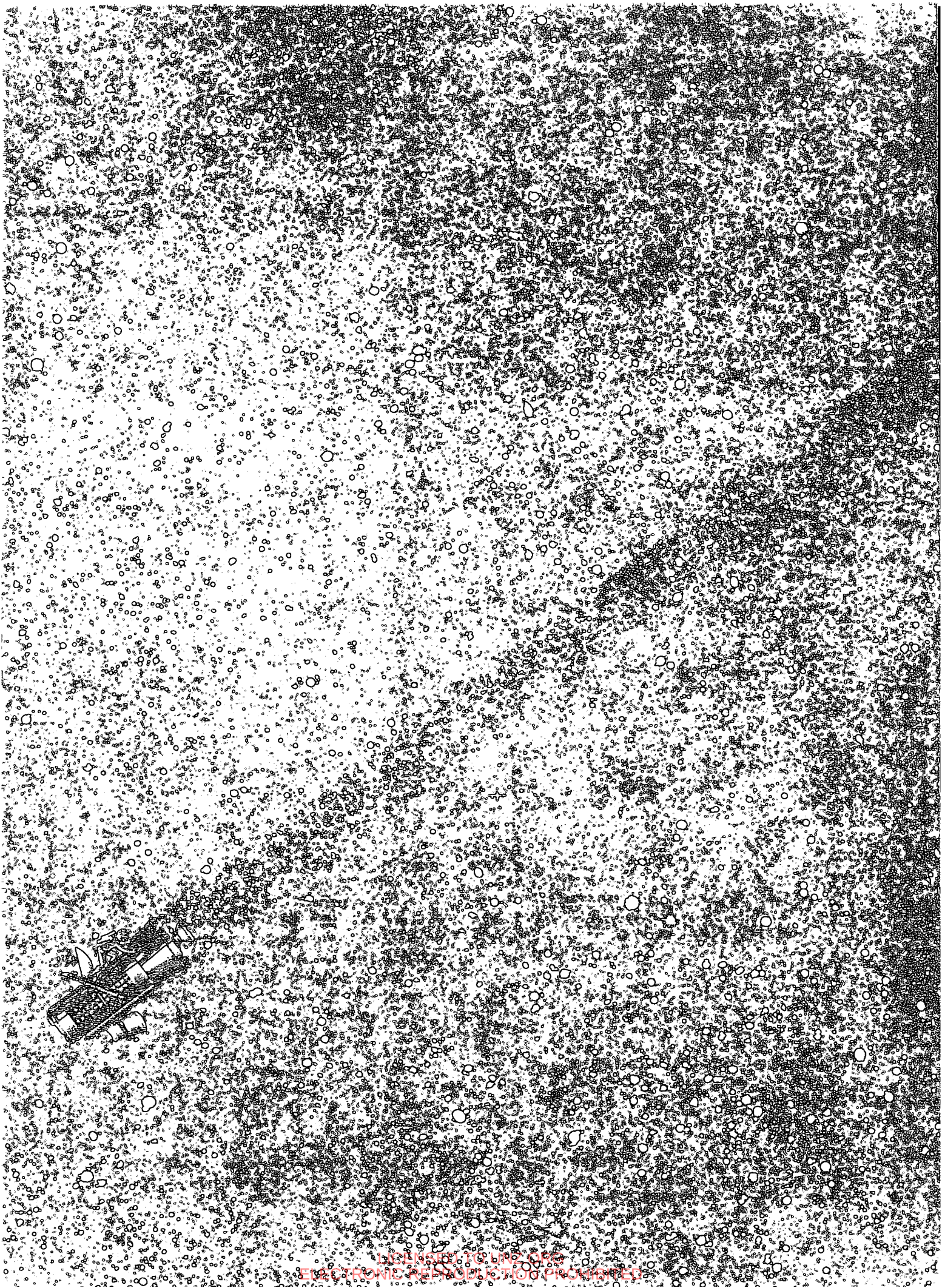

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LAST RESORT

The phenomenon of "hysterical strength" at the physical level is well known. Wonder what the equivalent phenomenon at the psychological level might do . . .

by STEPHEN BARTHOLOMEW

ILLUSTRATED BY GEORGE SCHELLING

I inflated a rubber balloon and set it adrift. The idea was that in free fall the balloon would drift slowly in the direction of the leak. This was the first thing I did after I had discovered the trouble. I mean it was the first action I took. I had been thinking about it for some time. I had been thinking about what a great distance it was from Pacific Grove, California to Mars, and how I would never breathe the odor of eucalyptus again.

I watched the white balloon floating in the middle of the cabin. Light reflected from a spot on its surface, and it made me think of a Moonglobe I used to keep on my desk when I was in college. I had turned off the fan, and tried to hold my breath to keep from distrubing the air. The balloon drifted slowly a few feet aft, wobbled there for a minute or two, then began to drift forward again. I decided to indulge in the rare luxury of a cigarette. I lighted one, reached over, and popped the balloon. The piece of rubber hung in the air, limp and twisted. I had not expected that trick to work.

The rate of leakage was very low. It had been some thirty-six hours since I'd first noticed it. This was one of those things, of course, that were not supposed to happen in space, and often did. Every precaution had been taken against it. The outer shell of the ship was tough enough to stop medium-velocity meteoroids, and inside the shell was a self-sealing goo, like a tubeless tire. Evidently the goo hadn't worked. Something had got through the hull and made a pinhole leak. In fact the hole was so small that it had taken me nearly thirty-five hours to compute the rate of leakage exactly. But it was big enough, it would do.

I had held the clipboard in my hand for a long time, rechecking the little black numbers on it again and again. Then I had warmed up the transmitter, raised Lunar Base, and reported what had happened. I had not reported before because I had not even been sure I had a leak. There's a normal seepage rate, of course; a certain amount of air will seep right through the molecular structure of the hull. That's what the reserve tanks are for. But I had been out a long time, and there wasn't enough left in the tanks to compensate for this. Not quite.

So I reported to Base. The operator on the other end told me to stand by for instructions. That was for my morale. Then I spent some time thinking about Pacific Grove, and the white house there, and the stand of eucalyptus. Then I blew up the balloon and popped it. As I was watching the piece of rubber hang motionless in the air the receiver began clicking. I waited till it stopped, then pulled out the tape and read it. It said, HAVE YOU INSPECTED HULL? I switched on the send key and tapped out, JUST GOING TO. STAND BY.

I opened the locker and broke out my spacesuit. This was the first time I had put it on since lift-off. Without help, it took me nearly half a hour to get it on and then check it out. I always did hate wearing a spacesuit, it's

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like a straitjacket. In theory I could have kept it on, plugged directly into the skip's oxygen supply, and ridden all the way back to Earth that way. The trouble with that idea was that the suit wasn't designed for it. You couldn't eat or drink through the helmet, and no one had ever thought up a satisfactory method of removing body wastes. That would be the worst way to go, I thought, poisoned slowly in my own juices.

When I finally did get the thing on, I went out the air lock. If the leak had been bad enough, I would have been able to see the air spurting out through the hole, a miniature geyser. But I found no more than what I expected. I crawled around the entire circumference of the hull and found only a thin silvery haze. The air as it leaked out formed a thin atmosphere around the hull, held there by the faint gravity of the ship's mass. Dust motes in the air, reflecting sunlight, were enough to hide any microscopic geyser spout. Before I re-entered the air lock I looked out into space, in the direction away from the sun. Out there, trailing far away, the air had formed a silver tail, I saw it faintly shimmering in the night. I was going to make a good comet.

I got back inside and stripped off the suit. Then I raised Lunar Base again and tapped out, HAVE INSPECTED HULL. RESULTS NEGATIVE. A few minutes later the reply came back, STAND BY FOR INSTRUCTIONS. For my morale.

I lighted another cigarette and thought about it some more. I looked around at the interior of my expensive, ten-foot coffin. I figured I would last for about another seventy-five hours. Of course I could take cyanide and get it over with. But this wouldn't be such a bad way to go. Within seventy-five hours the last of my reserve tanks would be empty. Then I would just wait for the rest of the air to leak out of the cabin. First I would lose consciousness with anoxia. I'd hardly even notice. Then as the pressure got lower my body fluids would begin to evaporate.

Once I had seen a mummy in a museum, it was some old prospector who had been lying in the Nevada desert for a hundred years or so. I was going to look like him, dried up, yellow, my teeth protruding in a grin, perfectly preserved. With no pilot, the ship would go into a cometary orbit around the sun. Maybe in a hundred years or so someone would come and take me back to a museum on earth.

I began to think about my wife, Sandy. I got out a piece of paper and wrote a long letter to her. I thought, maybe she'll even get to read it some day. Writing gave me something to do. I wrote about the time we had gone up to the Sierras together and slept in a sleeping bag at the edge of a four-thousand foot cliff. And about the times we had gone out in our cabin cruiser, the time we both nearly drowned. And asked about our daughter Wendy, who would be four now. I remembered part of an old poem:

Christ! That my love were in my arms,
And I in my bed again!

Writing was all right, until I realized that I had begun feeling sorry for myself, and I was letting it get into the letter. I put the letter aside and wondered what else I could do to kill time. I got out some of the film plates I'd made of the surface of Mars. Of course I had transmitted them all to Lunar Base, but it would have been nice if I could have delivered the original plates. I studied them for a while but didn't find anything I hadn't seen before. Well, I had done my job at least. I had orbited Mars, I had the glory of being the first American to do that. I had dropped the instrument package and transmitted all the data I could get back to Lunar. My only failure would be in not bringing back the ship.

I remembered a conversation I'd had at the last International Space Symposium in Geneva. A buddy of mine and I had taken out one of the Soviet cosmonauts and got him drunk. He was a dignified sort of drunk, a Party member who told long, pointless Russian jokes with an unwavering, serious expression. He sat sideways on the bar stool, holding his glass of vodka between two fingers and staring straight ahead. He said one thing that I had never forgotten.

"Do you know why we are ahead of you in space?" he had said, staring with dignity at the tall blonde at a nearby table. "It is because of your bourgeois sentimentality. You do not like risking men. You build a skyscraper in New York to house some insurance company. Two or three construction workers are maimed or killed on the job. One of your coal mines collapses and fifty men are trapped. Yet, look. You are afraid of losing men in space because of what the people at home might think. So you are too conservative, you avoid risks. So we are ahead of you. We send out a ship with three men aboard when you would risk only one. We are not sentimental, that is all. That is why we are ahead of you." He ordered another drink and stared into the mirror for several minutes, letting us think that over. Then he went on.

"Yes, you are less scientific than we, less logical. Yet that is your advantage, too. You are more alert to the unprecedented, the unpredictable. You are always ready for the Wild Chance, the impossible possibility. You expect the unexpected. You hope for the hopeless. Being sentimental, you have imagination."

His words came back to me. The unpredictable, the wild chance, the impossible possibility. That was all that could save me now. But what? Maybe another meteor would come along and plug the hole the first one had made. No. I had to think my way out of this one. But what if there was no way out?

I pushed myself to the aft bulkhead, turned and looked forward to the instrument panel. I picked out the smallest meter face. I could just read the numbers on it. I told myself: When I can't read the numbers

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any more I'll know my vision is blurring from the beginning of anoxia. I thought: When that happens I'll key in the transmitter and tap out, TELL SANDY GOOD-BY.

It would be dramatic anyhow.

A withered mummy in a flying tomb.

The receiver began clicking again. They're still worried about my morale, I thought. I went over and pulled out the tape. It said:

BRONSON HERE. SUGGEST YOU TRY LAST RESORT.

Dr. Bronson was the project director. It was a moment before I realized what he meant. When I did I hesitated for several minutes. Then I shrugged and tapped out, O.K.

I knew what had been happening down there. They had fed all the data I could give them through a computer, and the computer had said no dice. There was no solution to the problem, at least none that a computer could think of with the data available. There was still the Last Resort.

I wondered if cyanide might not be more pleasant. Well, the exects would have scientific interest anyway. The Last Resort was still Top Secret. And highly experimental. It was a new drug with a name a foot long, called LRXD for short. It had come out of the old experiments with lysergic acid and mescalin. I had never heard of its existence until a few hours before lift-off from Lunary Base. Then Dr. Bronson had given me a single ampule of the stuff. He had held it up to the light, looking through it. He said, "This is called LRXD. No one knows exactly what it will do. The lab boys say the 'LR' stands for Last Resort."

What it was *supposed* to do was increase mental efficiency in human beings. Sometimes it did. They had given it to one volunteer and then shown him an equation which it had taken a computer ten minutes to solve. He wrote down the answer at once, apparently having gone through the entire process in his head instantaneously.

Dr. Bronson told me, "It isn't just a matter of I.Q. It increases the total level of consciousness. Ordinarily the human brain screens out thousands of irrelevant stimuli. You're not aware of your watch ticking, or the fly on the wall, or your own body odor. You just don't *notice* them. But under LRXD, the brain becomes aware of everything simultaneously. Nothing is screened out. Furthermore, the subject is capable of correlating everything. The human brain becomes as efficient as a Mark 60 computer, with the advantage of imagination and intuition. We don't know how it works yet, or exactly what it does. I hate to say this. But there's even some evidence that the drug increases telepathic ability."

But then again, three of the volunteers had gone insane after taking the drug. Two had died. On some of the others there was no apparent effect at all.

"We don't even know whether the effects are permanent or temporary," Bronson had added.

So now I was supposed to take this Last Resort and then try to think a way out of my predicament, with my I.Q. boosted up to a thousand or so. It made me think of my college days, when I had stayed up all night on benzedrine, writing term papers. I remembered Bronson's description of one of the volunteers who had gone insane, and shuddered. Well, I had nothing to lose.

"It is what its name implies," Bronson had said. "To be used only in extreme emergency. Only when you have nothing to lose."

I had put the ampule away in the medicine locker and deliberately forgotten about it. Now I got it out again and held it up to the light as Bronson had done. Milky, white. I strapped myself to the acceleration couch, filled a syringe, and swabbed my arm. I looked at the letter I had started and probably would never finish. I rammed the needle in.

The hallucinations began within five minutes. This was normal, Bronson had said. I waited, gripping the armrests of the couch, hoping I would not begin believing in what I saw.

First there was the meter face directly in front of me. It was blue-green. I had never really seen before what color it was. It was like a round, bright flame. I stared at it, becoming hypnotized. Finally I couldn't stand it any more, I reached over and switched off the panel lights. Then the meter face became the blackest darkness I had ever seen, it was no longer a flat disk, but the entrance to a long, black tunnel, endless and narrow, I wanted to enter the tunnel and— Quickly I shifted my gaze. A gas tube rectifier caught my attention. This was like the meter face, only worse. A cloud of intense blue, flickering, shimmering —As I stared at it the cloud seemed to be expanding, growing, forever flickering and shimmering until it became vast, it filled the universe, pulsating with energy, it was a kind of blue I had never seen before . . . I had never seen color before. There was a red plastic safety guard over one of the toggle switches. Suddenly it seemed alive, rather the *red* was alive, the color was no longer part of the object, it was an entity in itself, blazing like flame, liberated from matter, it was a living drop of blood, afire.

I closed my eyes, trying to escape from color, but that was much worse. The colors inside my head blazed out even brighter, more savage.

I turned my head, trying to find something in the cabin to look at that was not bright blue or green or red. With horror I focused on the spacesuit locker. I had left the locker open, the suit hanging on its wire stretcher. I saw immediately that the spacesuit was alive. It stood there motionless, returning my stare, I could not look away from it. I could not move, with

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fear. Slowly, very slowly, the spacesuit raised an arm and pointed at me. I stared at its single, oval eye, recalling childhood nightmares. Then the suit came out of its locker and began to advance toward me, still pointing its gauntlet at my face. It seemed to take hours to walk across the cabin toward me. I held my breath, waiting. I thought I would scream if it did not reach me, it was taking too long.

Then it did reach me and, bending low above me, wrapped its metallic arms around my body. I turned my face from its mechanical, fiery breath. It began to crush me, I could not breathe, I felt my ribs begin to bend, slowly splinter. My face was pressed against its metallic chest, it was a thin gray wall . . .

Then there was nothing but the wall itself, dark, thin as a membrane, but impenetrably strong. I was pressing toward it, forcing my way, flattened against it, being crushed slowly between this thin, gray membrane and the tremendous weight of darkness at my back. I knew that if the membrane did not give, if I did not break through at last, I would suffocate and die. In fact I was already dead, the idea came to me with a weight of horror, I twisted, lashing out in total panic. Then the thin gray wall split and gave way, and I was free.

I was still strapped to my crash couch, regarding the instrument panel with absolute calm. Bronson had been right. I was aware of everything. I took in every meter indication simultaneously and correlated their date in my mind, without the help of the computer. I was aware of every sound, the faint hum of the gas tubes and transformers, the whir of the gyros, the reedy buzz of hydraulic actuators, the periodic clicking of the oxygen reclaim unit. I was aware of everything that was happening in the ship, as if it were my own body.

My body. I knew that I would have to explore my new self before investigating the ship. With an effort of will I shut off my new sense impressions, and—looked inside. I sensed the rhythmic muscular action of my heart, the opening and closing of the valves. I felt the surge of blood in all my vessels. I moved my hand to touch the bulkhead, and found that I could count the number of microseconds it took for the nerve impulses to travel from my fingers to my brain. Time seemed to have slowed down, it took an hour for the second hand on the panel clock to make one circuit.

In retrospect I know that this condition of superawareness must have lasted only for a few minutes. But it seemed then that I had all the time in the world.

I found that I no longer needed to think in words, or even symbols. I could pose myself a problem in, say, four-dimensional vector analysis and see the solution immediately, like a flash of intuition. I had attained total somatic consciousness; I was able to analyze the exact relationship of the drug to the molecular structure of my own protoplasm.

It was then I knew that, although I had recorded no information about Mars that the Russians didn't already have, I was going to bring back home a piece of candy much sweeter.

Wait, now, I told myself. Wait. You have a specific problem to solve. The problem being how to stop that leak in the hull long enough to get home alive. It was a problem of basic survival. I was confident. I knew that if any possible solution to my predicament existed I would find it. I was my own data computer now, but with eyes and ears and imagination. I opened my senses again and concentrated on the flood of information coming at me from the instrument panel. I found that I had total recall, I could remember—simultaneously—every wiring diagram and blueprint of the ship, every screw and transistor and welded seam, that I had ever glanced at. I saw the entire ship as a single entity, a smoothly functioning organism. In a flash I saw a hundred ways of improving its design. But that would have to wait. For a moment I gathered all my psychic energy and concentrated on the single crucial problem of stopping that leak.

And I saw that there was no way to stop the leak. No logical way.

Back at Lunar Base I tried to explain to Bronson what had happened. But I found that it was impossible to explain in words. In fact I no longer entirely understood, myself, what had happened. It was something that had occurred—not altogether on the conscious level. Something about my becoming aware, for a time, of the separate molecules of air within the cabin as extensions of my own body-mind. But I didn't know how to verbalize it.

Dr. Bronson gave me a thorough physical and a preliminary psychological exam. The effects of the drug had worn off, but I felt somehow—changed, I didn't know just how. In fact I wouldn't know until one day two years later, when I dropped a vial of nitroglycerine, and it miraculously did not go off. Still, Bronson pronounced me ready and fit for a long vacation, and in a few days I was headed back toward Pacific Grove.

The vacation lasted for a week. Then it was a Sunday evening, and I was sitting on the front porch of the white house nursing a highball while my wife was upstairs telling Wendy a bedtime story about a princess who kissed a toad, and it turned into a handsome prince.

I was sitting there in the evening light, inhaling the scent of eucalyptus and thinking for the thousandth time about how much better this was than bottled oxygen. Then a rented car pulled into the driveway, and General Bergen got out, wearing civilian clothes. He came up to the porch and sat down next to me. He did not pause for any pleasantries.

"Where's your wife?" he said.

"Upstairs."

"Anyone else in the house?"

"Just my daughter."

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He leaned back and lighted a cigarette. I was about to offer him a drink, but he didn't give me a chance.

"Official orders. From now on, you're Top Secret. You're wanted back at the Spacemedic Center in Washington. You have twenty-four hours to straighten out your affairs."

"What?"

He waved a hand. "I wasn't supposed to tell you this yet. Keep it under your hat." I noticed that the fingers holding his cigarette were trembling. "We spent four days going over the hull of your ship—with microscopes. Then we found it. The leak. The hole was still there. It must have been a micrometeor of high density and tremendous velocity. Burned a hole right through the sealing compound—"

Once again I tried to organize words to explain what I had not been able to explain before.

"But the ship's air did stop leaking. I could never have made it back . . ."

"But the *hole* was still there!" Then his voice faltered. "Don't you see? My God, what we have yet to learn about psi forces, psychokinesis . . . There was nothing to prevent all the air in your ship from leaking out through that pinhole, nothing except—you."

The general leaned forward, his elbows on his knees, looking out into the gathering darkness.

"We've got to find out what this drug *does*," he said.

"The space program . . ." I began.

"Space program?" He pulled on his cigarette. "Hell. What are rockets, compared to this?" ■

IN TIMES TO COME

■ *Next issue's lead novelette will be "The Dueling Machine," by Ben Bova and Myron B. Lewis.*

Now despite the fact that every man feels his cause is logical, just, reasonable, and founded on Truth and Honor . . . history shows that emotional attitudes such as that have never been subject to logic, reason, law, or justice. Argument per se doesn't change attitudes. Facts don't affect convictions. It takes emotional impact to do that.

That's why so many arguments have wound up with clubs, swords, muskets, machine guns, jet bombers . . . and we'd like to stop the progression. Yet, somehow, men just have to fight it out . . .

Bova and Lewis suggest a gorgeous answer—"The Dueling Machine," in which men can experience a fight, a duel, as an emotional reality . . . without the deadly physical reality.

There is, however, one slight difficulty. Was there ever any magnificent solution to a problem that somebody didn't figure out some way to louse it up?

And how in God's name can you trouble-shoot something that happened solely in somebody's imagination . . .?! Particularly when he's dead of that imagining!

Also coming: a new look at the surface of Mars—under "Observational Difficulties." One of our great troubles in guessing what the surface of a planet is like is that we have knowledge of the surface of only one and a half planets—which is a somewhat inadequate base for speculation about the other solar system worlds! George W. Harper suggests a surface picture for Mars that would upset the theories of both Percival Lowell and Edgar Rice Burroughs—as well as being quite unfamiliar to long-time science-fictioneers! ■ *The Editor.*

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FRIGID FRACAS

Second of Two Parts. When a situation in the world requires a certain idea, a certain approach to a problem, to the vast surprise of each inventor, he is apt to find others had the same notion . . .

by MACK REYNOLDS

ILLUSTRATED BY JOHN SCHOENHERR

SYNOPSIS

Major JOSEPH MAUSER, Category Military, Mid-Middle caste, is hanging one on, embittered by his inability to raise himself in caste to the ranks of that one per cent of the population of the West-world, the Uppers. He has devoted the past fifteen years of his life to mercenary soldiering in the fracases which are fought between corporations and is well thought of amongst his fellow pros.

He is approached by FREDDY SOLIGEN, Category Communications, Rank Telly Reporter, Low-Middle caste, who tells Joe he is using the wrong tactics in trying to achieve prominence. The fracas buffs, those who spend the greater part of their lives sitting before their Telly sets, sucking on trank pills, are ultimately the ones who count in anyone becoming a celebrity and being bounced in caste. And they prefer picturesque artificial heroes to the real thing. They want a glamorous, swashbuckling, mercenary with whom they can identify. Soligen suggests that Joe spend his resources on bribing fracas-buff magazines to boost him, Telly commentators to interview him, and Telly camera crews to keep him on lens when he's in action.

In return, Freddy expects help up the ladder of status once Joe has become an Upper. Joe, disillusioned in his efforts to achieve to Upper by his true military abilities, takes the Telly reporter up.

The campaign begins and NADINE HAER, Category Medicine, Rank Doctor, Mid-Upper caste, is surprised when she finds orchestras breaking into "The Girl I Left Behind Me," Joe's "theme song" when he enters bars or nightclubs, is surprised at his dashing new mustache, his fancy Imperial Hussar type uniform, and the considerable publicity he is receiving in the fracas-buff press. She ferrets out the scheme while they are having a date in the Exclusive Room, and is scornful of his ambitions to rise in caste level. She tells him the world is out of gear but the answer is not for individuals to attempt to better their position, but to change the rules of society. They quarrel, Joe stubbornly insisting that in a caste divided society, a person cannot fully realize himself until he has climbed to the top strata.

They are interrupted by a seemingly drunk ex-prizefight champion who provokes a fight and Joe is hard put to defeat the other.

The following day, Freddy Soligen is discussing with his son, SAM SOLIGEN, the desirability of the boy remaining in Category Religion, the one category in which it is possible to work your way up in caste, besides Military. Sam, unlike most of his contemporaries, has not been allowed to follow the fracases, nor to become addicted to trank. Rather, he is being carefully sent through the Temple schools by his ambitious father.

Joe Mauser turns up and accuses Freddy of having sicked the pugilist on him, as part of the campaign to build up Joe's name. Freddy cheerfully admits it, saying the prizefighter had been well paid to dive and that the story was in every paper and on Telly everywhere. Joe tells him bitterly that the prizefighter might have been paid to dive but had evidently forgotten it in the heat of the fight and Joe had to scuttle him. He demands to know why the campaign seems to be bogged down. He is still a major, still a Mid-Middle. Freddy worriedly tells him that they need some special gimmick. Something spectacular.

Joe has a date with Nadine to go soaring in his glider, and at her home meets PHILIP HOLLAND, Category Government, Rank Secretary, who is aide of the foreign minister and actually handles that office in its entirety. He is obviously not an Upper, and while Nadine dresses for the date, he tells Joe that the West-world is in a bad way. Comparing the present day fracases with the ancient Roman games, he reveals that the cost of the fracases have become so high as to be bankrupting the Welfare State, but they cannot be end-

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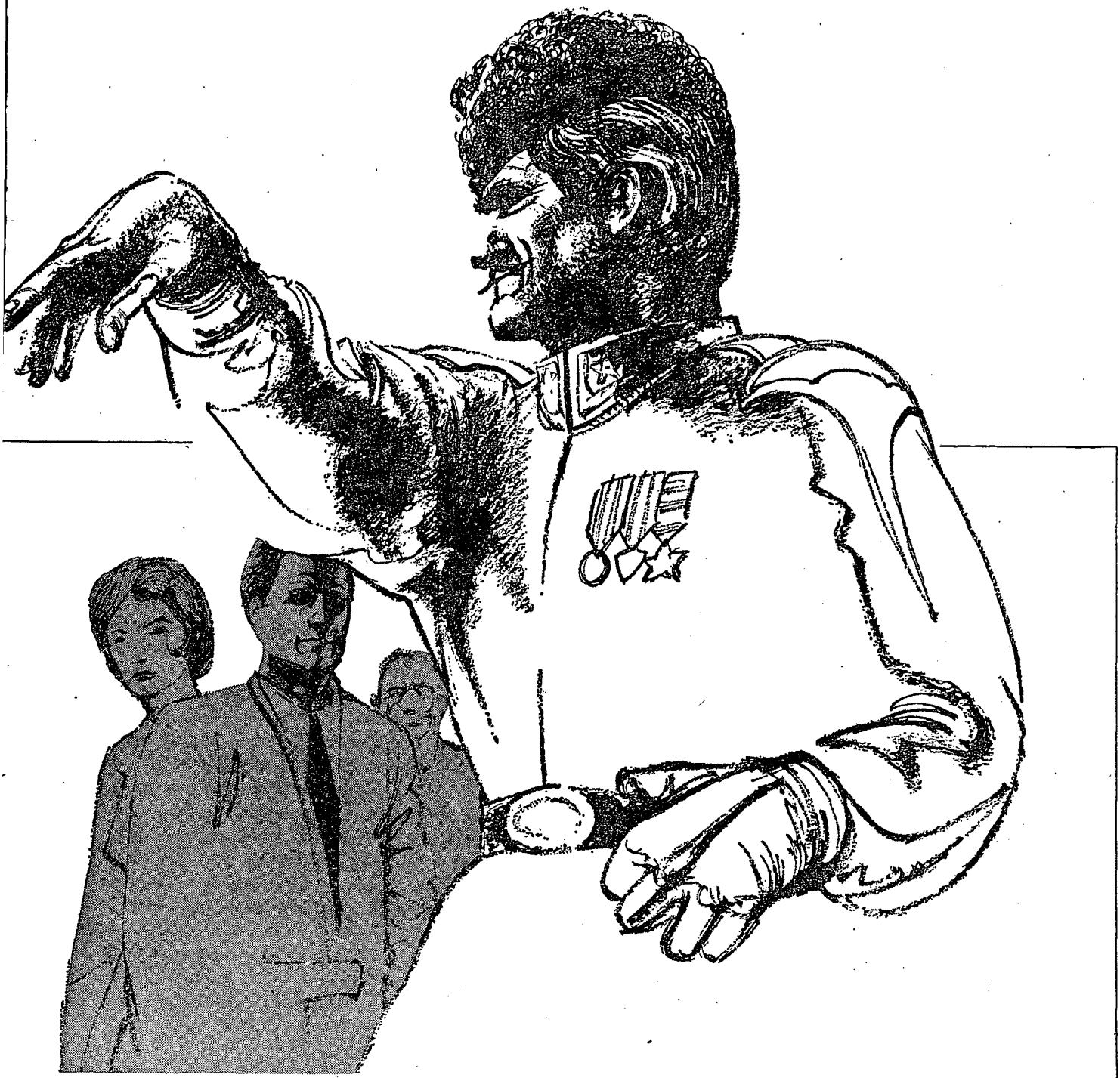

ed since they provide the equivalent of bread and circuses to the automation displaced Lowers. BALT HAER, Nadine's brother, enters and is haughty with both his status inferiors, accusing them of speaking subversion, and all but ordering them from the house. Nadine rescues the situation and after he leaves, reveals that Balt is a member of the ultra-conservative Nathan Hale society.

Joe is summoned by Marshal STONEWALL COGSWELL, and offered a commission flying his glider in a fracas the marshal is to have with General McCord, who has two glider pilots on his side. Cogswell offers to promote Joe's ambitions if he will line up with him.

At first Freddy Soligen is against this commission, feeling that flying a glider scout is too unspectacular to please the bloodthirsty fracas fans. But then he realizes that this can be the big gimmick. Joe will reintroduce the dogfight of World War One, by mounting a light machine gun and shooting down the enemy gliders. Freddy will be seated in the back seat of the glider with his Telly camera, the better to cover the fray.

When Nadine learns of Joe's commission, she tries to dissuade him. However, he reveals that he wishes to raise in caste so that he can court her as an equal. She offers to marry him at his present level, but he points out the impossibility. She then threatens that if he is the cause of a single casualty, she never will see him again.

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At the headquarters of Marshal Cogswell, he reveals his strategy to his staff officers. The enemy, among whom are Jack Altshuler, a cavalryman trained by Cogswell himself, are aware of his tactics and it is feared they will anticipate his action. He tells Joe to keep careful watch on Altshuler's heavy cavalry, from the air.

At the airport, immediately before take-off, Joe is approached by Lieutenant Colonel Lajos Arpàd, military attaché from the Sov-world, present to see that the Universal Disarmament Pact, which stipulates that no weapons of post-1900 be used in combat, is not negated. He warns Joe and Freddy Soligen that their case is to be taken up before the International Commission. Joe, however, takes off.

Far from surprising the two enemy gliders, Joe is jumped by them and finds that they, too, have mounted guns. They fight furiously, each seeking to climb higher and get on the other's tail. But then, in the midst of the fray, Joe realizes that he is being kept from seeing what is going on below. He dives sharply to observe Jack Altshuler's cavalry and the other two gliders are on his trail. Freddy is frantic. This aerial conflict is on lens in every Telly camera covering the fracas and Joe seems to be cowardly running. Joe, however, realizing how the marshal depends upon him, spots Altshuler's movements and crash lands his craft to bring his commander the news.

Later, while Joe is in the hospital, the Commission finds against him and the others involved in using gliders, strips him of his rank and savings, and orders him barred from Category Military. It would seem that complete disaster has struck, he not even having sufficient funds to pay his bill at the hospital.

Freddy Soligen, who also has seen his dream burst, returns to his home to find his son in the uniform of a Rank Private. The boy, caught up in the excitement of the fracases, and the example of Major Mauser, has switched categories, to his father's horror.

Nadine Haer visits Joe's hospital and Joe admits wryly that he has been a failure. He reminds her that she once told him that what was needed was not for individuals to attempt to better their condition, but to change the rules of the game, so that the whole world, bogged down in a status quo *social system, could renew the march of progress.*

He says, "O.K. Now I'm willing to listen. How do we go about changing the rules?"

PART TWO

XIV

Dr. Nadine Haer, Category Medicine, Mid-Upper caste, was driving and with considerable enjoyment resultant not only from her destination, long desired, now to be realized, but also from the sheer exuberance of handling the vehicle. Since pre-history, man's pleasure in the physical control of a speedy vehicle has been superlative, particularly when that vehicle is known by the driver to be unique in its class. The Hittite charioteer, bowling across the landscape of Anatolia, a Sterling Moss carefully tooling his automobile around the multi-curves of the Upper Cornice on the Riviera, or a Nadine Haer delicately trimming the controls of a sports model Hovercar.

She shot a quick glance at Joe Mauser, formerly of Category Military, formerly Rank Major, now an unemployed Mid-Middle who slouched in the bucketseat next to her. He noticed neither speed nor direction.

Nadine called, above the wind, "Zen, Joe! Where did you ever acquire such a car? It must have been built entirely by hand, and by Swiss watchmakers."

Joe stirred and shrugged. Newly from the hospital, he was still deep in the gloom of his recent loss of the dream, the defeat of his life-long ambitions. He said, "A buff gave it to me."

She slowed down, the better to frown at him in amazement. "*Gave* it to you? Why the thing is priceless."

Joe sighed and told her the salient details. "Quite a few mercenaries manage to acquire a private fracas-buff." He defined the term for her. "He makes a hobby of your career. Winds up knowing more about it than you, yourself can possibly remember. He follows every fracas you get into. Knows every time you cop one, how serious it was, how long you were in hospital. He glories each time you get a promotion, is in gloom each time your side loses a fracas. He's got pictures of you in various poses taken from the fracas-buff magazines, and files away all articles in which your name appears."

"Zen!" Nadine laughed in deprecation.

"That's just the beginning. After a while he starts writing you fan letters, wanting autographed portraits, wanting a souvenir—sometimes nothing more exciting than a button off your uniform. More often they want a gun, sword or combat knife, particularly one they saw you using in some fracas or other. They usually offer to pay for such, sometimes quite fabulous amounts. Other times they want a bit of bloody uniform, your own true blood from a time when you were in the dill and managed to cop one."

Nadine was astonished. Antagonistic as she was, herself, to the fracases, she wasn't particularly knowledgeable about all their ramifications. She said, repelled, "But doesn't such morbidity disgust you? This fawning, this slobbering—"

Joe grunted. "All part of the game. A mercenary without buffs to boost him, to form fracas-buff clubs and such, hasn't much chance of promotion. So far as disgust is concerned, you'd have to see one of the really far-out ones. The gleam in an ordinarily fishlike eye when he recounts the time you killed three men in

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hand-to-hand combat, equipped only with an entrenching tool, when they came at you with bayonets. The trace of spital, running down from the side of his mouth."

"And this buff of yours. Why did he give you this perfectly marvelous car?"

"It was a she, not a he," Joe said.

Nadine's voice changed infinitesimally. "You mean you accepted a gift of this value from a . . . woman?"

Joe looked at her and grinned sourly. "I wasn't in much of a position to refuse. The gift was in her will. She was well into her nineties when she died. She was an Upper-Upper, by the way, and the most knowledgeable fracas buff I ever met. She knew the intimate details of every fracas since Tiglath-Pileser and his Assyrians captured Babylon. She could argue for an hour on whether Parmenion or Alexander the Great should have been given the credit for the victory over the Persians at Issus." Joe grunted. "I suppose there should be a moral somewhere about this kindly old lady who was the outstanding fracas buff of them all."

Nadine Haer was in the process of hitting the drop lever with her left hand as they slowed and headed for the entrance to a parking area. She said brittlely, "The moral is that you can have slobs at any level in society. Being an Upper doesn't guarantee anything."

Joe sighed. "Here we go again." He looked about him, scowling. "Which brings to mind. Where *are* we going? These are governmental buildings, aren't they?"

They were sinking quickly, below street level, now in the power of the auto-parker. Nadine turned off the engine and released the controls. She said, cryptogrammicly, "We are going to see about doing something with your abilities other than shooting at people, or being shot at."

When the car was parked, she led the way to an elevator.

Joe said wryly, "Oh, great. I love mysteries. When do we find out who killed the victim?"

Nadine looked at him from the side of her eyes. "I killed the victim," she said. "Major Mauser, mercenary by trade, is now no more."

There was bitterness in him and he found no ability to respond to what was meant as humor in her words. He followed her silently and his puzzlement grew with him. The office building through which they moved was as well done as any he could ever remember having observed, even on the Telly. Surely they couldn't be in the Octagon or the New White House. But, if so, why?

Nadine said, "Here we are," and indicated a door which opened at their approach.

There was a receptionist in the small office beyond, a bit of ostentation Joe Mauser seldom met with in the modern world. What in the name of Zen could anyone need with other than an auto-receptionist? Didn't efficiency mean anything here?

The receptionist said, "Good afternoon, Dr. Haer. Mr. Holland is expecting you."

It came to Joe now—Philip Holland, secretary to Harlow Mannerheim, the Minister of Foreign Affairs. He had met the man a few months ago at Nadine's home in that swank section of Greater Washington once known as Baltimore. But he had no idea what Nadine had in mind bringing him here. Evidently, she was well enough into the graces of the bureaucrat to barge into his office during working hours. Surprising in itself, since, although she was an Upper born, still governmental servants can't be at the beck of every hereditary aristocrat in the land.

Holland stood up briefly at their entrance and shook hands quickly, almost abruptly, held a chair for Nadine, motioned to another one for Joe. He sat down again and said into an inter-office telly-mike, "Miss Mikhail, the dossier on Joseph Mauser, and would you request Frank Hodgson to drop in?"

What was obviously the dossier slid from the desk chute and Holland leafed through it, as though disinterested. He said, "Joseph Mauser, born Mid-Lower, Clothing Category, Sub-division Shoes, Branch Repair." Holland looked up. "A somewhat plebian beginning, let us admit."

A tic manifested itself at the side of Joe Mauser's mouth, but he said nothing. If long years of the military had taught him anything, it was patience. The other man had the initiative now, let him use it.

Holland cast his eyes ceilingward, and, without referring to the dossier before him, said, "Crossed categories at the age of seventeen to Military, remaining a Rank Private for three years at which time promoted to corporal. Sergeant followed in another three years and upon reaching rank of lieutenant, at the age of twenty-five was bounced in caste to High-Lower. After distinguishing himself in a fracas between Douglas-Boeing and Lockheed-Cessna was further raised to Low-Middle caste. By the age of thirty had reached Mid-Middle caste and Rank Captain. By thirty-three, the present, had been promoted to major, and had been under consideration for Upper-Middle caste."

That last, Joe had not known about, however, he said now, "Also at present, expelled from participation in future fracases on any level of rank, and fined his complete resources beyond the basic common stock issued him as a Mid-Middle." His voice was bitter.

Philip Holland said briskly, "The risks run by the ambitious."

The office door opened and a tall stranger entered. He had a strange gait, one shoulder held considerably lower than the other, to the point that Joe would have thought it the result of a wound hadn't the other obviously never been a soldier. The newcomer, office pallor heavily upon him, but his air of languor obviously assumed and artificial, darted his eyes around the room,

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to Holland, Nadine, and then to Joe where they rested for a moment.

He murmured some banality to Nadine, indicative of a long acquaintance and then approached Joe, who had automatically come to his feet, and extended a hand to be shaken. "I'm Frank Hodgson. You're Joe Mauser. I'm no fracas buff, but I know enough about current developments to know that. Welcome aboard, Joe."

Joe shook the hand offered, in some surprise.

"Welcome aboard?" he said.

Hodgson looked to Philip Holland, his eyebrows raised in question.

Holland said crisply, "You're premature, Frank. Dr. Haer and Mauser have just arrived."

"Oh." The newcomer found himself a chair, crossed his legs and fumbled in his pocket for a pipe, leaving it to the others to resume the conversation he had interrupted.

Philip Holland said to Joe, "Frank is assistant to Wallace Pepper." He looked at Hodgson and frowned. "I don't believe you have any other title do you, Frank?"

"I don't think so," Frank yawned. "Can't think of any."

Joe Mauser looked from one to the other, confusion adding to confusion within him. Wallace Pepper was the long time head of the North American Bureau of Investigations, having held that position under at least four administrations.

Nadine said dryly, "Which goes to show you, Joe, just how much titles mean. Commissioner Pepper has been all but senile for the past five years. Frank, here, is the true head of the bureau."

Frank Hodgson said mildly, "Why, Nadine, that's a rather strong statement."

Joe blurted, "Head of the Bureau of Investigation! I had gathered the impression I was being taken to meet some members of an underground, organized for the purpose of, as it was put, changing the present rules of government."

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Frank Hodgson grinned at Nadine and laughed softly, "That's a gentle way of describing revolution."

Holland looked at Joe Mauser and said briskly, "I'll try to take you off the hook as quickly as possible, Joe. Tell me, when you hear the word revolution, what comes first to your mind?"

Joe, flustered, said, "Why, I don't know. Fighting, riots, people running around in the streets with banners. That sort of thing."

"Um-m-m," Holland nodded. "The common conception. However, a social revolution isn't, by definition, necessarily bloody. Picture a gigantic wheel, Joe. We'll call it the wheel of history. From time to time it makes a turn, forward, we hope, but sometimes backward. Such a turn is a revolution. Whether or not there is anybody under the wheel at the time of turning, is beside the point. The revolution takes place whether or not there is bloodshed."

He thought a moment. "Or you might compare it to childbirth. The fact that there is pain in childbirth, or, if through modern medical science, the pain is eliminated, is beside the point. Childbirth consists of a new baby coming into the world. The mother might even die, but childbirth has taken place. She might feel no pain whatsoever, under anesthetic, but childbirth has taken place."

Joe said carefully, "I'm no authority, but it seems to me that usually if changes take place in a socio-economic system without bloodshed, we call it evolution. Revolution is when they take place with conflict."

Holland shook his head. "No. Poor definitions. Among other things, don't confuse revolts, civil wars, and such with revolution. They aren't the same thing. You can have civil war, military revolts and various civil disturbances without having a socio-economic revolution. Let's use this for an example. Take a fertile egg. Inside of it a chick is slowly developing, slowly evolving. But it is still an egg. The chick finally grows tiny wings, a beak, even little feathers. Fine. But so far it's just evolution, within the shell of the egg. But one day that chick cannot develop further without breaking the shell and freeing itself of what was once its factor of defense but now threatens its very life. The shell must go. When that culminating action takes place, you have a revolutionary change and we are no longer dealing with an egg, but a chicken."

Joe, one by one, looked at the three of them. He said, finally, to Nadine, rather than to the men, "What's this got to do with me?"

She leaned forward in her earnestness. "All your life you've revolted against the *status quo*, Joe. You've beaten your head against the situation that confronted you, against a society you felt didn't allow you to develop your potentialities. But now you admit you've been wrong. What is needed is to"—she shot a defiant glance at Frank Hodgson, to his amusement—"change the rules if the race is to get back onto the road to progress." She shrugged. "Very well. You can't expect it to be done single handed. You need an organization. Others who feel the same way you do. Here we are."

He was truly amazed now. When he had finally admitted interest in what Nadine had hinted to be a subversive organization, he'd had in mind some secretive group, possibly making their headquarters in a hidden cellar, complete with primitive printing press, and possibly some weapons. He most certainly hadn't expected to be introduced to the secretary of the Foreign Minister, and the working head of the North American Bureau of Investigation.

Joe blurted, "But . . . but you mean you Uppers are actually planning to subvert your own government?"

Holland said, "I'm not an Upper. I'm a Mid-Middle. What're you Frank?"

"Darned if I know," Hodgson said. "I forget. I think I was bounced up to Upper-Middle about ten years ago, for some reason or other, but I was busy at the time and didn't pay much attention. Every once in a while one of the Uppers I work with gets all excited about it and wants to jump me to Upper, but somehow or other we've never got around to it. What difference does it make?"

Joe Mauser was not the type to let his mouth fall agape, but he stared at the other, unbelievingly.

"What's the matter?" Hodgson said.

"Nothing," Joe said.

Philip Holland said briskly, "Let's get on with it. Nadine"—his voice had a dry quality—"is one of our most efficient talent scouts. It was no mistake I met you at her home, a few weeks back, Joe. She thought you were potentially one of us. I admit to having formed the same opinion, upon our brief meeting. I now put the question to you direct. Do you wish to join our organization, the purpose of which is admittedly, to change our present socio-economic system and, as Nadine put it, get back on the road to progress?"

"Yes," Joe said. "I do."

"Very well, welcome aboard, as Frank said. Your first assignment will take you to Budapest."

They were throwing these curves too fast for Joe. Noted among his senior officers as a quick man, thinking on his feet, he still wasn't up to this sort of thing. "Budapest!" he ejaculated. "The capital of the Sov-world? But . . . but *why*—?"

Philip Holland looked at him patiently. "There are many ramifications to revolution, Joe. Particularly in this present day with its Frigid Fracas which has gone on for generations between the West-world and the Sov-world and with the Neut-world standing at the sidelines glaring at us both. You see, really efficient revolutions may simply not look like revolutions at all—just unusual results of historic accidents. And if we're going to make this one peacefully, we've got to take

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every measure to assure efficiency. One of these measures involves a thorough knowledge of where the Sov-world stands, and what it might do if there were any signs of a changing in the *status quo* here in the West-world."

Frank Hodgson said idly, "I believe you have met Colonel Lajos Arpãd."

Joe said, puzzled still again, "Why, yes. One of their military attachés. An observer of our fracases to see whether or not the Universal Disarmament Pact is violated."

"But also, Colonel Arpád is probably the most competent espionage agent working out of Budagest."

"That corested, giggling nincompoop!"

Frank Hodgson laughed softly. "If even an old pro like yourself hasn't spotted him, then we have one more indication of Arpàd's abilities."

Philip Holland took up the ball again. "The presence of Colonel Arpád in Greater Washington is no coincidence. He is here for something, we're not sure what. However, rumors have been coming out of the Sov-world, and particularly Siberia, and the more backward countries to the south, such as Sinkiang. Rumors of an underground organized to overthrow the Sovs."

"And that religious thing," Nadine added.

Frank Hodgson murmured, "Yes, indeed. We received two more reports of it today."

All looked at him. He said to Joe, "Some fanatic in Siberia. A Tuvinian, one of the Turkic-speaking peoples in that area once called Tannu-Tuva, and now the Tuvinian Autonomous Oblast. He's attracting quite a following. Destroy the machines. Go back to the old way. Till the soil by hand. Let the women spin and weave, make clothing on the hand loom once more. Ride horses, rather than hovercraft and jets. That sort of thing. And, oh yes, kill those who stand in the way of this holy mission."

"And you mean this is catching hold in this day and age?" Joe said.

"Like wildfire," Hodges said easily. "And I wouldn't be too very surprised if it would do the same over here. Pressures are generating, in this world of ours. We'll either make changes peaceably or Zen knows what will happen. The Sovs haven't been exposed to religion for several generations, Joe. Probably the Party heads had forgotten it as a potential danger. Here in the West-world we do better. The Temple provides us with a pressure valve in that particular area, but I still wouldn't like to see our trank and Telly bemused morons subjected to a sudden blast of revival-type religion."

Joe looked back at Holland. "I still don't get my going to Budapest. How, why, when?"

Holland glanced at a desk watch and became brisk. "I have an appointment with the President," he said. "We'll have to turn this over to some of the other members of the group. They'll explain details, Joe. Nadine's going, too. In her case, as a medical attaché in our Embassy in Budapest. You'll go as a military observer, check on potential violations of the Universal Disarmament Pact." A sudden thought struck him. "I imagine it would add to your prestige and possibly open additional doors to you, if you carried more status." He looked again at the telly-mike on his desk. "Miss Mikhail, in my office here is Joseph Mauser, now Mid-Middle in caste. Please take the necessary steps to raise him to Low-Upper, immediately. I'll clear this with Tom, and he'll authorize it as recommended through the White House. Is that clear?"

In a daze, Joe could hear the receptionist's voice. "Yes, sir. Joseph Mauser to be raised to Low-Upper caste immediately."

XV

Budapest, basically, had changed little over half a millinnium.

The Danube, seldom blue except when seen through the eyes of a twosome between whom spark has recently been struck, still wandered its way dividing the old, old town of Pest from the still older town of Buda. Where the stream widens there is room for the one hundred and twelve acres of Margitsziget, or Margaret Island to the West-world. Down through the ages, through Celts and Romans, Slavs and Hungs, Turks and Magyars, none have been so gross as to use Margitsziget for other than a park.

Buda, lying to the west of the Danube, is of rolling hills and bluffs and of ancient towers, fortresses, castles and walls which have suffered through a hundred wars, a score of revolutions. It dominates the younger, more dynamic, Pest which stretches out on the flat plains to the east so that though you stand on the Hármashatàrhegy hill of Buda and strain your eyes, you are hard put to find the furtherest limits of Pest.

The jetport was on the outskirts of Pest, and the craft carrying Nadine Haer, Joseph Mauser and Max Mainz, settled in for a gentle landing, the autopilot more delicate far than human eye served by human hand.

Max, his eyes glued to the window, said, "Well, gee, it don't look much different than a lotta the other towns we passed over."

Nadine looked at him and laughed. She alone of the three of them had ever been outside the boundaries of the West-world having attended several international medical conventions. Over the years, the Frigid Fracas had laid its chill on tourism, so that now travel between West-world and Sov-world was all but unknown, and even visiting the Neut-world was considered a bit far out and somewhat suspect of going beyond the old time way of doing things—even among the Uppers. Securing a passport for a Middle's trip, not to speak of a Lower's, involved such endless bureaucratic red tape as to be nonsensical.

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Nadine said to Joe's batman, "What did you expect, Max?"

"Well, I don't know, Miss Haer. I mean, Dr. Haer. Kind of gloomier, like. Shucks, I've seen this here town on Telly a dozen times."

"And seeing is believing," Joe muttered cynically. "It looks as though we have a reception committee." He looked at Nadine. "Are we supposed to know each other?"

She shrugged and made a moue. "It would be somewhat strange if we didn't, seeing that we flew over in the same aircraft, and were the only passengers to come this far."

He nodded and as the plane came to a halt, helped her from her chair, even as the plane's ladder slipped out and touched to the ground.

Joe grunted and said, as though to himself, "You realize that for all practical purposes there hasn't been any improvement in aircraft for a generation?"

Nadine looked at him from the side of her eyes, even as they descended. "That's what I keep telling you, Joe. We've become ossified. When a society, afraid of change, adopts a policy of maintaining the *status quo* at any cost, progress is arrested. Progress *means* change."

He grinned at her. "Sure, sure, sure. Please, no more lectures, teacher. Let what's already in my head stew a while."

On the ground, Nadine was met by one contingent from the Embassy and from the Sov-world authorities, and Joe and Max by another. Joe became occupied, hardly more than noticing that she had been whisked away in a hoverlimosine, ornately bedecked with official flags and stars.

Joe, no longer holding military rank, in spite of his mission, was in mufti, and restrained himself from returning the salute when greeted by two fresh young lieutenants from the Embassy and a be-medaled lieutenant colonel in Sov-world uniform, whose tight-waisted tunic reminded Joe of that worn by Colonel Lajos Arpàd, the military attaché Joe had come across twice in West-world fracases, and who Frank Hodgson had branded an espionage agent. Joe swore again, inwardly, that these Hungarian officers must wear girdles under their uniforms, and wondered vaguely if they did so in combat.

The lieutenants, who could have been twins, so alike were they in size, bright smiling faces, uniform and words of welcome, saluted Joe, shook hands, and then turned to introduce him to the Sov-world officer.

One of them said, "Major Mauser, may we present you to Lieutenant Bela Kossuth of the Pink Army?"

They were, evidently, using Joe's old title of rank, as if he were retired rather than dismissed from the Category Military. It meant little to Joe Mauser. The Sov officer clicked his heels, bowed from the waist, extended his hand to be shaken. His waist might be pinched in like that of a girl of the Nineteenth Century, but his hand was dry and firm.

"The fame of Joseph Mauser has penetrated to the Proletarian Paradise," he said, his voice conveying sincerity.

Joe shook and said, "Pink Army? I thought you called it—"

The colonel was indicating a hoverlimosine with a sweeping gesture that would have seemed overly graceful, had not Joe felt the grip of the man only a moment earlier. Kossuth interrupted him politely, "The plane was a trifle late and the banquet we have prepared awaits us, major. A multitude of my fellow officers are anxious to meet the famed Joseph Mauser. Would it surprise you to know that I have replayed, a score of times, your celebrated holding action on the Louisiana Military Reservation? Zut! Unbelievable. With but a single company of men!"

Joe was looking at him blankly. *Celebrated?* Joe couldn't but remember the fracas the mincing Hungarian was talking about. When the front had collapsed, Joe, then a captain, had held his position in the swamps while his superiors were supposedly reforming behind him, actually while they frantically tried to reach terms with the enemy.

One of the West-world lieutenants laughed at Joe's expression. "You're going to have to get used to the fact that there're as many fracas buffs over here, sir, as there are back home."

The Sov colonel waggled a finger at him. "But, no, you misunderstand completely, Lieutenant Andersen. We *study* the bloody fracases of the West. Following the campaigns of such tacticians as your Marshal Stonewall Cogswell goes far toward the training of our own Pink Army in its, ah, fracases."

That brought up a dozen questions in Joe's mind, but first he turned and indicated Max, who'd been standing behind, his eyes wide, and taking in the luxurious airport, the vehicles about it, the buildings, the airport workers, few in number though they be, the road leading to the city beyond.

Joe said, "Gentlemen, may I present Max Mainz?"

The faces of the lieutenants went blank, and one of them coughed as though apologetically.

The Sov colonel looked from Joe to Max, and then back again, his face assuming that expression so well known to Joe for so very long. The aristocrat looking at one of lower class as though wondering what made the fellow tick. Kossuth said, "But surely this, ah, chap, is a servant, one of your, what do you call them, a *Lower*."

Max blinked unhappily and looked at Joe.

Joe Mauser said evenly, "I had heard the Sov-world was the Utopia of the proletariat. However, gentlemen, Max Mainz is my friend as well as my . . . assistant."

The three officers murmured some things stiffly to

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Max, who, a Lower born, was not overly nonplused by the situation. Zen, he knew the three were Upper caste, what was Major Mauser getting into a tissy about? He was given a seat in the front, where the chauffeur would have once been, and the others took places in the rear, one of the lieutenants dialing the hovercar's destination.

Joe Mauser said, "I am afraid my background is hazy, Colonel Kossuth. You mentioned the Pink Army. You also mentioned your own fracases. I knew you maintained an army, of course, but I thought the fracas was a West development, in fact, your military attachés are usually on the scornful side."

The two lieutenants grinned, but Kossuth said seriously, "Major, as always, nations which hold each other at arm's length, use different terminology to say much the same thing. It need not be confusing, if one digs below to find reality. Perhaps, for a moment, we four can lower barriers enough for me to explain that whilst in the West-world you hold your fracases to"—he began enumerating on his fingers—"One, settle disputes between business competitors, or between corporations and unions. Two, to train soldiers for your defense requirements. Three, to keep bemused a potentially dangrous lower class. . . ."

"I object to that, colonel," one of the lieutenants said hotly.

The Sov officer ignored him. "Four, to dispose of the more aggressive potential rebels, by allowing them to kill each other off in the continual combat."

"That, sir, is simply not true," the lieutenant blurted. Joe couldn't remember if he was Andersen or Dickson, even their names were similar.

Joe said, evenly, "And your alternative?"

The Hungarian shrugged. "The Proletarian Paradise maintains two armies, major. One of veterans, for defense against potential foreign foes, and named the Glorious Invincible Red Army—"

"Or, the Red Army, for short," one of the lieutenants murmured dryly.

". . . And the other composed of less experienced proletarians and their techno-intellectual, and sometimes even Party, officers. This is our Pink Army."

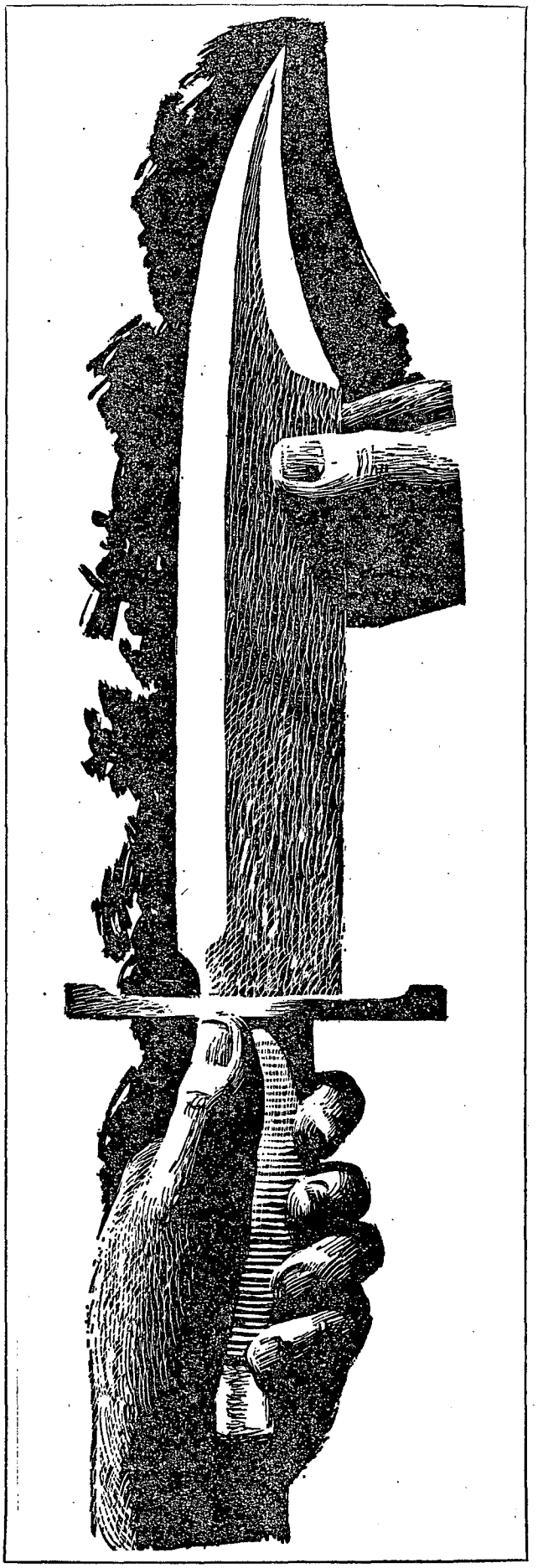
"Wait a moment," Joe said. "What's a proletarian?"

The lieutenant who had protested the Sov officer's summation of the reasons for the West-world fracases, laughed dryly.

Kossuth stared at Joe. "You *are* poorly founded in the background of the Sov-world, major."

Joe said, "Deliberately, Colonel Kossuth. When I learned of my assignment, I deliberately avoided cramming unsifted information. I decided it would be more desirable to get my information at the source, uncontaminated by our own West-world propaganda."

One of the stiff-necked twins, both of whom Joe was beginning to find a bit *too* stereotyped West-world ad-



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herents, said, "Sir, I must protest. The West does not utilize propaganda."

"Of course not," Kossuth said, taking his turn at a dry tone. He said to Joe, "I admire your decision. Obviously, a correct one. Major, a proletarian is, well, you could say, ah—"

"A Low-Lower," Andersen or Dickson said.

"Not exactly," the Sov protested. "Let us put it this way. Marx once wrote that when true Socialism had arrived, the formula would be from each according to his abilities and to each according to his needs. Unhappily, due to the fact that the Proletarian Paradise is surroundeed by potential enemies, we have not as yet established this formula. Instead, it is now from each according to his abilities and to each according to his contribution. Consequently, the most useful members of our society are drawn into the ranks of the Party, and, contributing the most, are most highly rewarded. The Party consists of somewhat less than one per cent of the population."

"And is for all practical purposes, hereditary," Andersen or Dickson said.

Kossuth, in indignation, parroted, unknowingly, the lieutenant's earlier words. "That, sir, is simply not true."

Joe said, soothing over the ruffled waters, "And the . . . what did you call them . . . techno-intellectuals?"

"They are the second most useful members of society. Our technicians, scientists—although many of these are members of the Party, of course—teachers, artists, Pink and Red Army officers, and so forth."

Max looked around from the front seat. "Well, gee, that sounds just about like Uppers, Middles and Lowers to me."

Joe Mauser cleared his throat and said to the Hungarian who was glaring at Max. "And the Pink Army?"

But Kossuth bit out to Max, "Don't be silly, my man. There are no classes in the Proletarian Paradise."

"Yeah," Max said, "and back in the West-world we got People's Capitalism and the people own the corporations. Yeah."

"That'll be all, Max," Joe said, getting in before the two lieutenants could snap something at the fiesty little man. Joe had already decided the lieutenants were both Uppers, and was somewhat surprised at their lowly rank.

Kossuth brought his attention back to Joe. "We're almost to our destination, Major Mauser. However, briefly, some of the more recent additions to the Sov-world, particularly in the more backward areas of southern Asia, have not quite adjusted to the glories of the Proletarian Paradise."

Both of the lieutenants chuckled softly.

Kossuth said, "So it is found necessary to dispatch punitive expeditions against them. A current such expedition is in the Kunlun Mountains in that area once known as Sinkiang to the north, Tibet to the south. Kirghiz and Kazakhs nomads in the region persist in rejecting the Party and its program. The Pink Army is in the process of eliminating these reactionary elements."

Joe was puzzled. He said, "You mean, in all these years you haven't been able to clean up such small elements of enemies?"

Kossuth said stuffily, "My dear major, please recall that we are limited to the use of weapons pre-1900 in accord with the Universal Disarmament Pack. To be blunt, it is quite evident that foreign elements smuggle weapons into Tibet and other points where rebellion flares, so that on some occasions our Pink Army is confronted with enemies better armed than themselves. These bandits, of course, are not under the jurisdiction of the International Commission and while we are limited, they are not."

"Besides," one of the lieutenants said, "They don't want to clean them up. If they did, the Sov equivalent of the fracas buff wouldn't be able to spend his time at the Telly watching the progress of the Glorious Pink Army against the reactionary foe."

Joe, under his breath, parroted the words of the Sov officer. "That, sir, is simply not true."

Max, who had largely been staring bug-eyed out the window at the passing scene, said, "Hey, the car's stopping. Is this it?"

XVI

Although in actuality working on a private mission for Philip Holland, Frank Hodgson and the others high in government responsibility who were planning fundamental changes in the West-world, Joseph Mauser was ostensibly a military attaché connected with the West-world Embassy to Budapest. As such, he spent several days meeting embassy personnel, his immediate superiors and his immediate inferiors in rank. He was, as a newcomer from home, wined, dined, evaluated, found an apartment, assigned a hovercar, and in general assimilated into the community.

Not ordinarily prone to the social life, Joe was able to find interest in this due to its newness. The citizen of the West-world, when exiled by duty to a foreign land, evidently did his utmost to take his native soil with him. Even house furnishings had been brought from North America. Sov food and drink were superlative, particularly for those of Party rank, but for all practical purposes all such supplies were flown in from the West. Hungarian potables, not to mention the products of a dozen other Sov political divisions including Russia, were of the best, but the denizens of the West-world Embassy drank bourbon and Scotch, or at most the products of the vines of California. The styles of Budapest rivaled those of Paris and Rome New York and Hollywood, but a feminine employee of

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the embassy wouldn't have been caught dead in local fashions. It was a home away from home, an oasis of the West in the Sov-world.

Joe, figuring that in view of the double role, unknown even to the higher ranking officers of the embassy, he could best secure protective coloring by conforming and would have slipped into embassy routine without more than ordinary notice. But that wasn't Nadine's style.

From the first, she gloried in pörkölt, the veal stew with paprika sauce, in rostélyos, the round steak potted in a still hotter paprika sauce, in halászlé, the fish soup which is Hungary's challenge to French bouillabaisse, and threatened her lithe figure with her consumption of rétes, the Magyar strudel. All these washed down with Szamorodni or a Hungarian Riesling, the despair of a hundred generations of connoisseurs due to its inability to travel. When liqueurs were called for, barack, the highly distilled apricot brandy which was still the national tipple, was her choice, if not Tokay Aszu, the sweet nectar wine, once allowed only to be consumed by nobility so precious was it considered.

Her apartment became adorned with Hungarian, Bulgarian and Czech antiques, somewhat to the surprise even of the few Sovs with whom she and Joe associated. It had been long years since antiques were in vogue. She dressed in the latest styles from the dressing centers of Prague, Leningrad or from the local houses, ignoring the raised eyebrows of her embassy associates.

Joe, with an inner sigh, followed along in the swath she cut, Nadine being Nadine, and the woman he loved, to boot.

His being raised in caste to Upper through the easy efforts of Philip Holland, had made no observable difference in his relationship with Nadine. Of course, she was Mid-Upper, he told himself, while he was Low-Upper. Still, it was far from unknown for romances to cross such comparatively little boundary. He couldn't quite figure out why she seemed to hold him at arm's length. Months had passed since she had told him, that day, she would marry him, even though he be a Middle. But now, when he tried to get her off by herself, for a moment of intimacy between them, she avoided the situation. When he brought their personal relationship into the conversation, she switched subjects. Joe, wedded for too long to his grim profession, inexperienced in the world of the lover, was out of his element.

His Upper caste rating also made little impression on the other embassy personnel, largely because it was the prevalent rank. In dealing with the Sovs, they came into contact almost exclusively with Party members and policy was that West-world officials never be put in the position to have to work with Sovs who ranked them. Only routine office workers were drawn from Middle caste, and largely they kept to themselves except during working hours.

Joe's immediate superior turned out to be a General George Armstrong, with whom Joe had once served some years earlier when the general had commanded a fracas between two labor unions fighting out a jurisdictional squabble. Although Joe hadn't particularly distinguished himself in that fray, the general remembered him well enough. Joe, recognized as the old pro he was, was taken in with open arms, somewhat to the surprise of older embassy military attaches who ranked him in caste, or seniority.

At the first, getting organized in apartment and office, getting his feeling of Budapest, its transportation system, its geographical layout, its offerings in entertainment, he came little in contact with either the Hungarians or the other officials of the Sov world, who teemed the city. In a way it was confusion upon confusion, since Budapest was the center of world sovism and the languages of Indo-China, Outer Mongolia, Latvia, Bulgaria, Karelia, or Albania were as apt to be heard on street or in restaurant, as was Hungarian.

But Joe Mauser was in no hurry. His instructions were to take the long view. To take his time. To feel his way. Somewhere along the line, a door would open and he would find that for which he sought.

In a way, Max Mainz seemed to acclimate himself faster than either Nadine or Joe. The little man, completely without language other than Anglo-American, the lingua franca of the West, whilst Joe had both French and Spanish, and Nadine French and German, was still of such persistent social aggressiveness that in a week's time he knew every Hungarian of proletarian rank within a wide neighborhood of where they lived or worked. Within a month he had managed to acquire present tense, almost verbless, jargon with which he was able to conduct all necessary transactions pertaining to his household duties, and to get into surprisingly complicated arguments as well. Joe had to give up attempting to persuade him that discretion was called for in discussing the relative merits of West-world and Sov-world.

In fact, it was through Max that Joe Mauser made his breakthrough in his assignment to learn the inner workings of the Sov-world.

XVII

It was a free evening for Joe, but one that Nadine had found necessary to devote to her medical duties. Max had been gushing about a cabaret in Buda, a place named the Bécsikapu where the wine flowed as wine can flow only in the Balkans and where the gypsy music was as only gypsy music can be. Max had developed a tolerance for wine after only two or three attempts at what they locally called Sor and which he didn't consider exactly beer.

Joe said, only half interested, "For proletarians, Party members, or what?"

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Max said, "Well, gee, I guess it's most proletarians, but in these little places, like, you can see almost anybody. Couple of nights ago when I took off I even seen a Russkie field marshal there. And was he drenched."

Joe was at loose ends. Besides, this was a facet of Budapest life he had yet to investigate. The intimate night spots, frequented by all strata of Sov society.

He came to a quick decision. "O.K., Max. Let's give it a look. Possibly it'll turn out to be a place I can take Nadine. She's a bit weary of the overgrown glamour spots they have here. They're more ostentatious than anything you find even in Greater Washington."

Max said, in his fiesty belligerence, "Does that mean better?"

Joe grunted amusement at the little man, even as he took up his jacket. "No, it doesn't," he said. "and take the chip off your shoulder. When you were back home you were continually beefing about what a rugged go you had being a Mid-Lower in the West-world. Now that you're over here the merest suggestion that all is not peaches at home and you're ready to fight."

Max said, his ugly face twisted in a grimace, even as he helped Joe with the jacket, "Well, all these chracters over here are up to their tonsils in curd about the West. They think everybody's starving over there because they're unemployed. And they think the Lowers are, like, ground down, and all. And that there's lots of race troubles, and all."

Even as they left the apartment, Joe was realizing how much closer Max had already got to the actual people, than either he or Nadine. But he was still amused. He said, "And wasn't that largely what you used to think about things over here, when you were back home? How many starving have you seen?"

Max grunted. "Well, you know, that's right. They're not as bad off as I thought. Some of those Telly shows I used to watch was kind of exaggerated, like."

Joe said absently, "If international fracases would be won by newspapers and Telly reporters, the Sovs would have lost the Frigid Fracas as far back as when they still called it the Cold War."

The Bécsikapu turned out to be largely what Max had reported and Joe expected. A rather small cellar cabaret, specializing in Hungarian wines and such nibbling delicacies as túróscsusza, the cheese gnocchis; but specializing as well or even more so in romantic atmosphere dominated by the heartstring touching of gypsy violins, as musicians strolled about quietly, pausing at this table or that to lean so close to a feminine ear that the lady was all but caressed. It came to Joe that there was more of this in the Sov world than at home. The Sov proletarians evidently spent less time at their Telly sets than did the Lowers in the West-world.

They found a table, crowded though the nightspot was, and ordered a bottle of chilled Reteasca. It wasn't until the waiter had recorded the order against Joe's international credit identification, that it was realized he and Max were of the West. So many non-Hungarians, from all over the Sov-world, were about Budapest that the foreigner was an accepted large percentage of the man-in-the street.

Max said, making as usual no attempt to lower his voice, "Well, look there. There's a sample of them not being as advanced, like, as the West-world. A waiter! Imagine using waiters in a beer joint. How come they don't have auto-bars and all?"

"Sure, sure, sure," Joe said dryly. "And canned music, and a big Telly screen, instead of a live show. Maybe they prefer it this way, Max. You can possibly carry automation too far."

"Naw," Max protested, taking a full half glass of his wine down in one gulp. "Don't you see how this takes up people's time? All these waiters and musicians and all could be home, relaxing, like."

"And watching Telly and sucking on tranks," Joe said, not really interested and largely arguing for the sake of conversation.

A voice from the next table said coldly in accented Anglo-American, "You don't seem to appreciate our entertainment, gentlemen of the west."

Joe looked at the source of the words. There were three officers, only one in the distinctive pinch-waisted uniform of the Hungarians, a captain. The other two wore the Sov epaulets which proclaimed them majors, but Joe didn't place the nationality of the uniforms. There were several bottles upon the table, largely empty.

Joe said carefully, "To the contrary, we find it most enjoyable, sir."

But Max had had two full glasses of the potent Reteasca and besides was feeling pleased and effervescent over his success in getting Joe Mauser, his idol, to spend a night on the town with him. He'd wanted to impress his superior with the extent to which he had got to know Budapest. Max said now, "We got places just as good as this in the West, and bigger too. Lots bigger. This joint wouldn't hold more than fifty people."

The one who had spoken, one of the majors who wore the boots of the cavalryman, said, nastily, "Indeed? I recognize now that when I addressed you both as gentlemen, I failed to realize that in the West gentlemen are not selective of their company and allow themselves to wallow in the gutter with the dregs of their society."

The Hungarian captain said lazily, "Are you sure, Frol, that *either* of them are gentlemen? There seems to be a distinctive *odor* about the lower classes whether in the West-world or our own."

Joe came to his feet quietly.

Max said, suddenly sobered, "Hey, major, sir . . . easy. It ain't important."

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Joe had picked up his glass of wine. With a gesture so easy as almost to be slow motion, he tossed it into the face of the foppish officer.

The Hungarian, aghast, took up is napkin ahnd began to brush the drink from his uniform, meanwhile sputtering to an extent verging on hysteria. The major who had been seated immediately to his right, fumbled in assistance, meanwhile staring at Joe as though he were a madman.

The cavalryman, though, was of sterner stuff. In the back of his mind, Joe was thinking, even as the other seized a bottle by its long neck and broke off the base on the edge of the table, *Now this one's from the Pink Army, an old pro, and a Russkie, sure as Zen made green apples.*

The major came up, kicking a chair to one side. Joe hunched his shoulders forward, took up his napkin and with a quick double gesture, wrapped it twice around his left hand, which he extended slightly.

The major came in, the jagged edges of the bottle advanced much as a sword. His face was working in rage, and Joe, outwardly cool, decided in the back of his mind that he was glad he'd never have to serve under this one. This one gave way to rage and temper when things were pickling and there was no room for such luxuries in a fracas.

Max was yelling something from behind, something that didn't come through in the bedlam that had suddenly engulfed the Bécsikapu.

At the last moment, Joe suddenly struck out with his left leg, hooked with his foot the small table at which the three Sov officers had been sitting and twisted quickly, throwing it to the side and immediately into the way of his enraged opponent.

The other swore as his shins banged the side and was thrown slightly forward, for a moment off balance.

Joe stepped forward quickly, precisely, and his right chopped down and to the side of the other's prominent jawbone. The Russkie, if Russkie he was, went suddenly glazed of eye. His doubling forward, originally but an attempt to regain balance, continued and he fell flat on his face.

Joe spun around. "Come on, Max, let's get out of here. I doubt if we're welcome." He didn't want to give the other two time to organize themselves and decide to attack. Defeat the two, he and Max might be able to accomplish, but Joe wasn't at all sure where the waiters would stand in the fray, nor anyone else in the small cabaret, for that matter.

Max, at the peak of excitement now, yelled, "What'd you think I been saying? Come on, follow me. There's a rear door next to the rest room."

Waiters and others were converging on them. Joe Mauser didn't wait to argue, he took Max's word for it and hurried after that small worthy, going round and about the intervening tables and chairs like an old time broken field football player.

XVIII

Joe Mauser had assumed there would be some sort of reverberations as a result of his run-in with the Sov officers, but hadn't suspected the magnitude of them.

The next morning he had hardly arrived at the small embassy office which had been assigned him, before his desk set lit up with General Armstrong's habitually worried face. He said, without taking time for customary amenities, "Major Mauser, could you come to my office immediately?" It wasn't a question.

In General George Armstrong's office, besides the general himself, were his aide, Lieutenant Andersen, who Joe had at long last sorted out from Lieutenant Dickson, Lieutenant colonel Bela Kossuth and another Sov officer whom Joe hadn't met before.

Everybody looked very stiff and formal.

The general said to Joe, "Major Mauser, Colonel Kossuth and Captain Petöfi have approached me, as your immediate superior, to request that your diplomatic immunity be waived so that you might be called upon on a matter of honor."

Joe didn't get it. He looked from one of the two Hungarians to the other, then back at Armstrong, scowling.

Lieutenant Anderson said, unhappily, "These officers have been named to represent Captain Sándor Rákóczi, major."

Bela Kossuth clicked his heels, bowed, said formally, "Our principal realizes, Major Mauser, that diplomatic immunity prevents his issuing request for satisfaction. However"—the Hungarian cleared his throat—"since honor *is* involved—"

At long last it got through to Joe. His own voice went coldly even. "General Armstrong, I—"

The general said quickly, "Mauser, as an official representative of the West-world, you don't have to respond to anything as dashed silly as a challenge to a duel."

The faces of the two Hungarians froze.

Joe finished his sentence. ". . . I would appreciate it if you and Lieutenant Anderson would act for me."

Kossuth clicked his heels again. "Gentlemen, the *code duello* provides that the challenged choose the weapons."

General Armstrong's face, usually worried, was now dark with anger. "Choice of weapons, eh? Against Sándor Rákóczi? If you will excuse us now, gentlemen, Lieutenant Andersen and I will consult with you in one hour in the Embassy Club and discuss the affair further. I say frankly, I have never heard of a diplomat being subjected to such a situation, especially on the part of officers of the country to which he is accredited."

The Hungarians were unfazed. Kossuth looked at his wrist chronometer. "One hour in the Embassy Club, gentlemen." The two of them clicked again, bowed from the waist, and were gone.

General Armstrong glared at Joe. "Dash it, if you

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hadn't been so confoundedly quick on the trigger, I could have warned you, Mauser."

Joe Mauser wasn't over being flabbergasted. "You mean to tell me," he said, "that these people still conduct duels? I thought duels had gone out back in the Nineteenth Century."

"Well, you're mistaken," Armstrong bit out. "It seems to be a practice that can crop up in any decadent society. Remember Hitler reviving it among the German universities? Well, it's all the rage now among the officers of the Sov world. Limited, however, to Party members, *the lowly proletariat are assumed not to have honor.*"

Joe shrugged. "I'm not exactly an amateur at combat, you know."

The general snorted his disgust and turned to his aide. "Lieutenant, go find Dr. Haer for me. Then wait in the outer office until it's time for us to meet those heel-clicking Hungarians."

"Yes, sir," Andersen saluted, shot another look at Joe as though in commiseration, and left hurriedly.

"What's wrong with him?" Joe said.

Armstrong pulled open a desk drawer, brought forth a bottle and glass, poured himself a strong one and knocked it back without offering any to his junior officer. He replaced bottle and glass and turned his scowl back to Joe. "Haven't you ever heard of Sándor Rákóczi?"

"No."

"He happens to be All-Sov-world Fencing Champion and has been for six years. H also is third from the top amongst the Red Army pistol and rifle marksmen. I once saw him put on an exhibition of trick handgun shooting. Uncanny. The man has abnormal reflexes."

The door opened and Nadine was there. "Joe," she said. "Dick Andersen says you've been challenged to a frame-up duel by Sándor Rákóczi." Her eyes hurried on to Armstrong. "George, this is ridiculous. Joe has diplomatic—"

Joe wasn't getting part of this. He broke in. "What do you mean, frame-up, Nadine? We got into a hassle in a nightspot last night."

Armstrong said, "Everybody simmer down, dash it!" His eyes went to Joe. "Sándor Rákóczi doesn't get into hassles in nightspots—not unless he's been ordered to. *Captain Rákóczi is what in the old days was known as a* hatchetman." He snorted in deprecation. "The Party no longer conducts purges among its own. Everything is all buddy-buddy now. Purges are something from the past. However, those on the very top sometimes find this unfortunate. One manner that has been devised to remove such Party members who have become a thorn in the side of the powers that be, is to have them challenged by such as Sándor Rákóczi."

Joe settled down into a chair, more dumfounded than ever. "But that's ridiculous. *Why?* Why should they want me eliminated?"

Nadine said hurriedly, "You don't have to accept."

Joe said, "If I don't, I'll be laughed out of town. Remember that big banquet the Pink Army gave me when I first arrived? The celebrated Major Joseph Mauser fling? What happens to West-world prestige when the celebrated Joe Mauser backs down from a duel?"

General Armstrong mused, "If Mauser refuses the duel, he's right, he'll be laughed out of town. If he accepts it, and is killed, he is still removed from the scene." He looked from Joe to Nadine. "Somebody evidently doesn't want Joe Mauser in Budapest."

Pieces were beginning to fit in.

Joe looked at George Armstrong. "You're one of us, aren't you? One of the Phil Holland, Frank Hodgson group." He looked at Nadine. "Why wasn't I told? Am I a junior member or something, that I can't be trusted?"

Armstrong snorted. "You should study up on revolutionary routine, Joe. The smaller the unit of organization, the better. The fewer members you know, the fewer you can betray. Here in the Sov-world, back before the Sovs came to power, the size of their cells was five members, so the most any one person could betray was four."

The tic started at the side of Joe's mouth.

Armstrong said hurriedly, "Don't misunderstand. Your fortitude isn't being questioned. Bravery no longer enters into it. There are methods today under which nobody could hold up." He seemed to come to a sudden decision. "We can't let this take place. You'll have to back down, Mauser. Somehow, there's been a leak and your real purpose in being in Budapest is known. Very well, Phil Holland and the others will simply have to send someone else to replace you."

But Joe had had enough by now. "Look," he said. "Everybody seems to think I can't take care of myself with this foppish molly and his fancy swordsmanship. I've had fifteen years of combat."

"Joe!" Nadine said, "don't be silly. The man's a professional assassin. This is his field, not yours."

Joe said flatly, "On the other hand, I have a job to do and it doesn't involve being run out of Budapest."

General Armstrong said, "Dash it, don't go drivel-happy on us, Mauser. I've just told you, the man's the best swordsman in Europe and Asia combined, and the third best shot."

"*How is he with Bowie knives?*" Joe said.

XIX

To Joe Mauser's surprise, the Sovs actually turned up two genuine Bowie knives. He had expected the duel, actually, to have to be conducted with trench knives or some other alternative. But the Sovs, ever great on museums, had located one of the weapons of the American Old West in a Prague exhibit of the American frontier, the other in Budapest itself in an extensive collection of fighting knives, down through the ages, in a military museum.

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Formally correct, Lieutenant colonel Bela Kossuth appeared at Joe Mauser's apartment three days before the duel, a case in his hands. Max, in his role as batman, conducted him to Joe, doing little to keep his scowl of dislike for the Hungarian from his face. Max was getting fed up with the airs of Sov officers; caste lines were over here, if anything, more strictly drawn than at home.

Joe came to his feet on recognizing his visitor and answered the other's bow. "Colonel Kossuth," he said.

Bela Kossuth clicked heels. He held the case before him, opened it. Two heavy fighting knives lay within. Joe looked at them, then into the other's face.

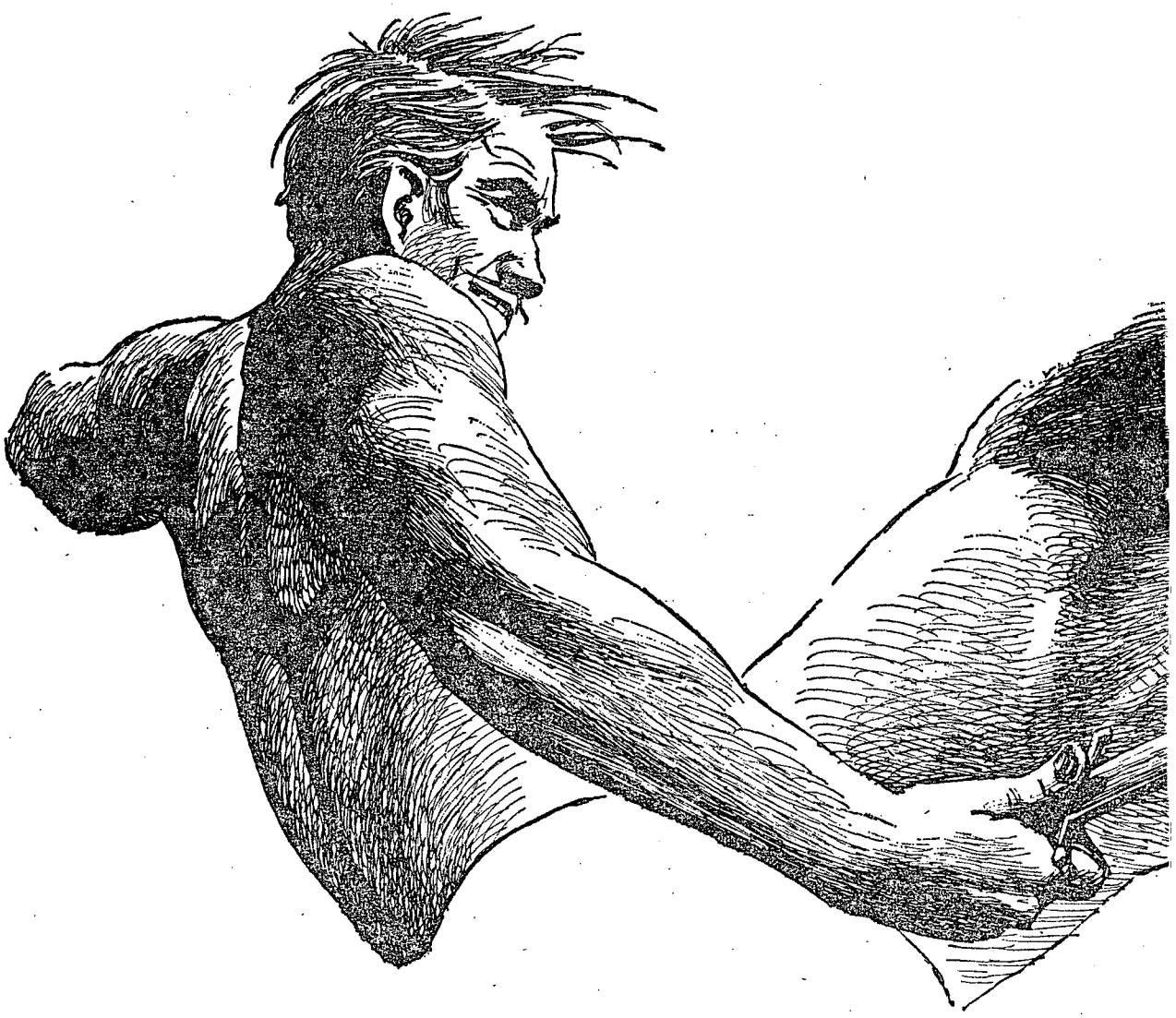
Kossuth said, "Frankly, major, your somewhat unorthodox selection of weapons has been confusing. However, we have located two Bowie knives. Since it is assumed that the two gentlemen opponents are not thoroughly familiar with, ah, Bowie knives, it has been suggested that each be given his blade at this time."

Joe got it now. Sándor Rákóczi hadn't become the most celebrated duelist in the Sov-world by making such mistakes as underrating his opponents. The weapon was new to him. He wanted the opportunity to practice with it. It was all right with Joe.

Kossuth clicked heels again. "Our selection, unfortunately, is limited to two weapons. Since you are the challenged, Captain Rákóczi insists you take first choice."

Joe shrugged and took up first one, then the other. It had been some time since he had held one of the famous frontier weapons in his hands. When still a sergeant in the Category Military, he had once become close companions with an old pro whose specialty was teaching hand-to-hand combat. Over a period of years, he and Joe had been comrades, going from one fracas to another as a team. He had taught Joe considerable, including the belief that of all blade hand weapons ever devised, the knife invented by Jim Bowie, whose frontier career ended at the Alamo, was the most efficient.

Joe ran his eyes over the blades carefully. On the back of one was stamped, *James Black, Washington, Arkansas*. Joe had found what he was looking for, however, he pretended to examine the other knife as well, ignoring the Sheffield, England stamp of manufacture.



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The Bowie knife: Blade, eleven inches long by an inch and a half wide, the heel three eighths of an inch thick at the back. The point at the exact center of the width of the blade, which curved to the point convexly from the edge, and from the back concavely, both curves being as sharp as the edge itself. The crossguard was of heavy brass, rather than steel and a further backing of brass along the heel, up to the extent where the curve toward the point began. Brass, which is softer than steel, and could catch an opponent's blade, rather than allowing it to slip off and away.

Joe balanced the weapon he had selected, and shrugged. "This one will do," he said.

Kossuth clicked the case with the remaining knife shut. He could see no difference between the two. The selection of weapons had been a formality.

Max saw him to the door and returned to the living room. He said worriedly, "Major, sir ,you sure you're checked out on that thing? I've been asking around, like, and they put these duels on Telly here, just like we got fracases back home. This here Captain Rákóczi's got one whopper of a reputation. He's quick as a snake. Kinda like a freak. He can move faster than most people."

"So they've been telling me," Joe mused, balancing the frontier weapon in his hand. It had a beautiful balance, this knife so big that it could be used as a hatchet or machete.

He was still contemplating the vicious looking blade when Nadine entered. He smiled up at her, put the knife aside on the table, and came to his feet.

She looked at Max, and the little man turned and left the room.

Nadine said, "Joe, a plane is leaving this afternoon. A West-world plane for London."

Joe looked at her speculatively. "I won't be on it."

"Joe, listen. A year ago you were an individual, trying to fight your way up to Upper caste. You weren't able to make it as an individual, Joe. But now you're a member of an organization, pledged to a high ideal. Joe, the organization doesn't need martyrs at this stage. It does

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need good, competent, highly trained members such as Joe Mauser."

He said nothing.

Nadine stepped suddenly closer to him. Her perfume, he noted, vaguely, was new, some scent found here in the Sov world, undoubtedly. It had a heady quality, or was that merely the close presence of Nadine herself?

She put her arms around his neck and pulled his head down to her level. He had never realized that Nadine Haer was this much shorter than he. She pressed the softness of her lips to his.

Then she held back a foot or two, and said into his face, desperately serious, "Does this make any difference, Joe?"

He licked the edges of his lips, carefully, "It makes a great deal of difference." His voice was thick. His arms came up behind her.

"Then you'll be on the plane?"

He shook his head.

She wrenched herself suddenly free and stood back from him, infuriated. He had never seen anyone so infuriated.

He said, "Look, darling. If I backed out of this, the way you want, you think you'd be happy. But you wouldn't. You want a man, not a coward."

"I want a *live* man! Not a dead hero."

He shook his head stubbornly. "You mentioned the organization. All right, they sent us to do a job here. They can't move in the West-world until they know where the Sov-world stands. They can't afford an attack, a sudden heating up of the Frigid Fracas, right in the middle of the confusion of a socio-economic change. They've got to know how the Sov-world stands, what it will do. They've got to know about this so-called underground, and the religious revival stuff out there in Siberia."

"You've been discovered," she said hotly. "They can send somebody else."

He was still stubborn. "No. There's a leak. If they send somebody else, the same thing will happen. And the next man might not be as much of a potential opponent to such as Sándor Rákóczi as even I am. If I run now, the West loses prestige, and the movement sponsored by Holland and Hodgson and the rest of us, loses prestige, too. Somewhere, in Budapest, is some kind of a group that is watching us. We don't know who, or where, or what they stand for, but we can't afford to lose prestige with them."

"We're not exactly going to gain it, when and if this official assassin kills you." She looked down at the wicked knife, and shuddered. "Oh, Joe, your mercenary career is over. Miraculously, you stayed alive for fifteen years through it all. From Rank Private all the way up to Rank Major. Now, at long last, you're even an Upper. You're not going to throw it all away, now."

He could say nothing.

She stamped a foot in uncharacteristic fury. "You silly clod. Suppose you do win? Don't you see? They'll simply send another killer after you. They're out to get you, Joe Mauser. Don't you see you can't win against the whole Sov-world? Next time, possibly they won't be quite so formal. Possibly a few footpads in the streets. Do you think they haven't the resources to kill a single man?"

The side of his mouth twitched. "I'm sure they have. But it will give me a few days before they come up with something else. It'd be too conspicuous if I fought their top duelist one day, and then was cut down on the streets the next."

She spun, in a fury, and all but ran from the room and from his apartment.

Joe looked after her ruefully. He growled in sour humor, "Every time matters pickle for me, my gal goes into a tissy and runs off."

XX

As Max had said, as one of their alternatives to the fracas of the West-world, the Sovs put on Telly such duels as were fought amongst their supposedly honor-conscious officer caste. Evidently, the lower caste of the Proletarian Paradise was well on the way to its own version of bread and circuses. In fact, Joe had already wondered what their version of trank was.

But though the Telly cameramen were highly evident, and for this inordinary affair had six cameras in all, placed strategically so that every phase of the fight could be recorded, they were not allowed to be so close as by any chance to interfere with the duel itself. Spaced well back from the action, they must needs depend upon zoom lenses.

Joe Mauser and Sándor Rákóczi stood stripped to the waist, both in tight, non-restricting trousers, both wearing tennis shoes. General Armstrong and Lieutenant Andersen, on one side, and Lieutenant colonel Kossuth and Captain Petöfi, on the other, stood at the sides of their principals.

Kossuth was saying formally, "It has been agreed, then, that the gentlemen participants shall be restricted to this ring measuring twenty feet across. Seconds will remain withdrawn to twenty feet beyond it. The conflict shall begin upon General Armstrong calling *commence*, and shall end upon one or the other, or both, of the gentlemen participants falling to the ground. Minor wounds shall not halt the conflict. This is understood?"

"Yes," Joe said. He had been sizing up his enemy. The man stripped well. He was almost a duplicate of Joe's build, perhaps slightly lighter, slightly taller. Like Joe, he bore a dozen scars about his upper torso. Sándor Rákóczi hadn't worked his way to the top in the dueling world without taking his share of punishment.

Rákóczi said something curtly, obviously affirmative, in Hungarian.

Lieutenant Andersen, his open face drawn worriedly,

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tendered Joe his Bowie knife. Captain Petöfi proffered Rákóczi his. The two men stepped into the arena, which had been floored with sand, its dimensions marked with blue chalk. Though nothing had been said, it was obvious that if a combatant stepped over this line he would have lost face.

They stood at opposite sides of the arena, both with arms loose at their sides, both holding their fighting knives in their right hands.

General Armstrong said, his voice tight and worried, "Ready, Captain Rákóczi?"

The Hungarian used his affirmative word again.

"Ready, Major Mauser?"

"Ready," Joe said. He felt like adding, *as ready as I'm ever going to be.* He was feeling qualms now. He'd been too long in the game not to recognize a superlative opponent when he saw one.

The four seconds drew back their twenty feet and joined the two doctors and half dozen hospital assistants who were there. Further back still, Joe knew, were emergency facilities. Two men by contemporary usage were going to be allowed to butcher each other, but moments after, all the facilities of modern medical science were going to be at their disposal. Joe felt a wry twinge of humor at the incongruity of it.

General Armstrong called, "Commence!"

Joe spread his legs, grasped the knife so that his thumb was along the side of the blade and held approximately waist high. He shuffled forward, slowly, feeling the consistency of the sand. There must be no slipping.

The Sov officer had assumed the stance of a swordsman. His smile was foxlike. For the first time, Joe noticed the scar along the other's cheek. It was white now, which brought it into prominence. Yes, Sándor Rákóczi, in his time, had copped one more than once. At least the man wasn't infallible.

As they came cautiously toward each other, the Hungarian grinned, fox-fashion, and said in his heavily accented Anglo-American, "Ah, our bad man from the West, you thought to choose a weapon unknown to Rákóczi, eh? But perhaps you have never heard of the Italian short sword, eh? Do you think this clumsy weapon is so different from the Italian short sword, eh?"

Joe had never heard of the Italian short sword, though now it came back to him that some of the phony-fracas films he had seen back home had depicted medieval duelists fighting with two swords, one long, one short. Obviously, his Sov opponent was thoroughly familiar with the usage. Joe swore inwardly.

They circled, warily, watching for an opening, sizing up the other. Each knew that once action was joined, events would most likely progress quickly. The Bowie knife was not built for finesse.

Like a flash, Sándor Rákóczi darted in, his blade flicked, he leapt back, instantly on guard again. There was a streak of red down Joe's arm.

Joe blinked. Somebody, General Armstrong, or was it Max? had said there was something freakish about this Hungarian. His reflexes were unbelievably fast. Now, Joe could believe it.

He attempted a slashing blow himself, and the other danced away so quickly that Joe had not come within feet of his opponent.

Rákóczi laughed insinuatingly. "Oaf," he said. "Is that the word? Clumsy, awkward, stumbling . . . oaf. It is well to rid the world of such, eh?"

He was a talker. Joe had met the type before, especially in hand-to-hand combat. They talked, usually insultingly, sometimes bringing up such matters as your legitimacy, or the virtue of your wife or sister, or your own supposed perversions. They talked, and by so doing hoped to enrage you, provoke you into foolish attack. Joe was untouched by such tactics. He circled again, his mind moving quickly.

He had, he realized, no advantages on his side. He was neither stronger nor faster than the other, and he had no reason to believe that he had greater stamina. If anything, it might be the other way.

Rákóczi was in again, through Joe's guard, darting his blade as though it were a foil. A cut opened magically on Joe's chest from left nipple to navel, and bled profusely.

The Sov duelist was back a good six feet, and laughing openly. Joe had had insufficient time even to move one foot in retreat at the other's offensive.

Joe Mauser wet his lips. The tic at the side of his mouth was in full evidence.

Rákóczi jeered, "Ah, my bad man from the West who throws wine in the face of gentlemen. You grow afraid, eh? Your mouth twitches. You feel in your stomach the fear of death, eh? No longer do you worry about locating the Sov-world underground and helping to overthrow the Party, eh? Now you worry about death."

Joe tried rushing him, plowing through the sand. But the Hungarian danced back, still jeering. He obviously knew the feel of sand beneath foot, as Joe did not. Joe had no time to wonder over Armstrong and Andersen agreeing to a sand deep arena. They had missed up on that one. For Joe, it was like trying to operate on a sandy beach, but Rákóczi seemed in his element.

Even as Joe's attack slowed in frustration, the other darted in, slashed once, twice, scoring on Joe's left arm, once, twice.

He was beginning to resemble a bloody mess. None of the wounds were overly deep, but combined they were costing him blood. He got the feeling that the Hungarian could finish him off at will. That Rákóczi had his number. That it was no longer a matter of the other being careful not to underestimate the foe. Joe had been correctly estimated and found wanting. He realized that only by sinking to the sand could he throw the fight. The duel ended upon one combatant or the other falling to the sand.

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And then he could see the other's expression. There was to be no throwing in of the towel for Joe Mauser. At the first sign of such a move, the other would dart in, cobra-quick, and deal the finishing blow. The death blow. Rákóczi was fully capable of such speed. The man was a phenomenon, metabolically speaking.

Joe, his heels almost to the chalk line of the arena boundary, dashed suddenly forward again. His opponent, jeering, as before, darted backward with such speed, even through the sand, as to be unbelievable.

Joe Mauser grinned wolfishly. He tossed the Bowie knife suddenly into the air. It turned in a spin to come down blade in his hand.

He stepped forward with his left foot, threw with full might. The Bowie knife, balanced to turn once completely in thirty feet, blurred through the air and buried itself in the Hungarian's abdomen, up to the hilt.

The Sov officer grunted in agony, stared down at the protruding hilt unbelievingly. His eyes came up in hate, glaring at Joe who stood there across from him, hands now extended forward in the stance of a karate fighter.

Joe could follow the other's agonized thoughts in his expression. There were medics available and though the wound was a decisive one, it need not be fatal, not in this day of surgery and antibiotics. No, not fatal, the Sov officer decided. He glared at Joe again, his teeth grinding in his pain and shock. To move across the ring at the American would be disastrous, stirring the heavy Bowie knife in his intestines.

Rákóczi knew he had only split seconds, then he must sink to the sand so that aid might come. But perhaps split seconds were sufficient. He reversed his own knife in hand, preparatory to throwing.

Joe watched him. The other's face was a mask of pure agony, but he was no quitter. He was going to make his own throw.

It came, blurringly fast, too fast to avoid. The heavy frontier knife turned over half in air and struck Joe along the side, glancing off, ineffectively. Sándor Rákóczi fell to the sand and the medics came on the run, both toward him and to Joe.

And then the fog began to roll in on Joe Masuer, and he noted, as though distantly, that the medical assistance that General Armstrong had provided from the West-world Embassy was headed by Dr. Nadine Haer, who seemed to be crying, which was uncalled for in a doctor with a patient, after all.

XXI

His wounds were clean, straight slashes not overly deep and which should heal readily enough. In his time, Joe Mauser had copped many a more serious one. However, after bandaging, Nadine relegated him to the small embassy hospital. The West-world diplomats would not even trust the Sov-world medical care, preferring to import their own Category Medicine personnel.

He was, so Max informed him, the lion of the West-world colony in Budapest. And the Neut-world too, for that matter. It was quite a scandal that a diplomatic representative had been challenged to a duel by a known killer of Rákóczi's reputation. Informal protests were lodged. Joe, cynically, could imagine just how effective they would be, particularly at this late date.

A lion he might be, but Nadine was not allowing him visitors this first day of his recuperation. Max, to attend him, but no others. At least, so it was throughout the morning and early afternoon. Then, so obvious was it that his hurts were not of paramount importance, she relented to the extent of allowing General Armstrong to enter.

The general scowled down at him, as though to read just how badly Joe was feeling. He grumbled, finally, "Dash it, you looked nothing so much as an overgrown hamburger steak there for a while, Mauser."

Joe grinned wryly, "It's how I felt," he said. "I've never seen anyone move so fast."

Armstrong said curiously, "If you wanted to use throwing knives, why didn't you challenge him to a duel with throwing knives?"

Joe shifted his shoulders. "I figured my only chance with him was to use a weapon with which he wasn't familiar. The Bowie knife was it. It didn't occur to him that a knife built in that shape and as big as that, was a precisely constructed throwing knife as well as one to use hand to hand." Joe twisted his mouth. "Besides, if the Sovs think all the Mahiavellians are on their side, they're wrong. Poor Captain Rákóczi got sucked in. *I* had a throwing knife, but he didn't."

Armstrong looked at him blankly.

Joe explained. "The knife designed by Jim Bowie was made by a smith named James Black, of Washington, Arkansas. Bowie made himself so notorious with it that the blade became world famous and Black made quite a few exact copies. Various other outfits tried to duplicate his work, but actually none succeeded in producing the perfect balance in such a large knife that made it practical for throwing. It turns over once in thirty feet, exactly. All I had to do was to get Rákóczi fifteen feet away from me, and he'd had it. And his own knife, when he tried to reciprocate, was off balance."

Armstrong said, "Zen!"

"By the way, how is he?" Joe said.

Armstrong said, soberly, "He's dead, Mauser."

"Dead! With all those doctors standing around?"

The general's face assumed its habitually worried expression. "I rather doubt that he died of your knife. The highest echelons of the Party do not approve of failures. You were correct when you said you would have lost prestige had you fled Rákóczi's challenge or even insisted upon your diplomatic immunity rights. As it is, the prestige has been lost on the other side. By the way, it occurs to me that no further effort will be made to eliminate you physically. It would be too blatant."

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Joe said, "One of the things I wanted to talk to you about, general. While we were in there together, Rákóczi was sounding off in an effort to crack my nerve. Called me a lot of names, that sort of thing. But he also said, I'll try to repeat this exactly, *No longer do you worry about locating the Sov-world underground and helping overthrow the Party, eh?*"

Armstrong slumped down into the bedside chair. "Dash it! That makes it definite. They're fully aware of your mission, though they haven't got it exactly right. Your purpose isn't to aid the local underground but merely to size it up, get the overall picture." He snorted his disgust. "I'll have to get in touch with our organization in Greater Washington. One thing certain, we're not going to be able to let you go into the field in your status as military attaché and observer."

Joe had been scheduled to observe some of the combat taking place in Chinese Turkestan with nomad rebels. He had looked forward to the experience, in view of his own background, wondering in what manners the Sov forces of the Pink Army differed from the mercenary armies of the West-world. He said now, "Why not?"

Armstrong snorted. "You'd never come out alive. There'd be an accident, and the nomads would be given the dubious credit for having killed you." He came to his feet again. "I've got to think about this. I'll drop in later, Mauser."

Joe thought about it too, after the other had left. Obviously, the restrictions on his movements were a growing handicap on his abilities to serve the organization headed by Holland Hodgson. He wondered if he was becoming useless.

Max stuck his head in the door and said, "Major, sir, one of these here Hungarians wants to see you."

"Who?" Joe growled. "And why?"

"It's that Lieutenant colonel Kossuth one, sir. I told him Doc Haer said you couldn't be bothered, but he don't seem to take no for an answer."

Kossuth, Joe Mauser knew, was assigned to the West-world Embassy military attaché department on a full time basis. It occurred to him that the Hungarian would be privy to the inner workings of the Party as they applied to Joseph Mauser and his associates.

"Show him in," he told Max.

"But the Doc—"

"Show him in, Max."

Lieutenant colonel Bela Kossuth was solicitous. He clicked heels, bowed from the waist, inquired of Joe's well being.

Joe wasn't feeling up to military amenities after his framed-up near demise of the day before. He growled, "I'd think you'd be wishing I occupied Captain Rákóczi's place, rather than offering me sympathy."

The Hungarian's eyebrows went up, and uninvited he took the chair next to the bed. "But why?"

"You *were* the man's second."

Kossuth was expansive. "When asked to act, I could hardly refuse a brother officer. Besides, my superiors suggested that I take the part. As you probably have ascertained, major, there is considerable doubt the desirability of you remaining in Budapest."

Joe was astonished. "You mean to sit there and deliberately admit the duel was a planned attempt to eliminate me?"

The colonel coolly looked about the room. "Why not, major? There is no one here to witness our conversation."

"And you admit that your precious Party, the ruling organ of this Proletarian Paradise of yours, actually orders what amounts to assassination?"

Kossuth examined his fingernails with studied nonchalance. "Why not admit it? The Party will do literally anything to maintain itself in its position, major. Certainly, the death of a junior officer of the West-world means nothing to them."

"But aren't you a Party member yourself?"

"Of course. One must be, if one is to operate as freely as circumstance allows in this best of all possible worlds, this paradise of ours."

Joe sank back on his pillow. He couldn't get used to the idea of this man, whom he had always thought of as the arch-stereotype Sov-world officer, speaking in this manner.

Kossuth crossed his legs comfortably. "See, here, major, you are all but naive in your understanding of our society. Let me, ah, brief you, on the history of this part of the world, and the organization which governs it. Have you studied Marx and Engels?"

"No," Joe said. "I've read a few short extracts, and a few criticisms, or criticisms of criticisms of short extracts. That sort of thing."

Kossuth nodded seriously. "That's all practically anybody does any more, even in the Sov-world where we give lip service to them. The point I was about to make is that the supposed founders of our society had nothing even remotely approaching this in mind when they did their research. It evidently never occurred to either that the first attempts to achieve the—" the Hungarian's voice went dry—"glorious revolution, would take place in such ultra-backward countries as Russia and China. The revolution of which they wrote presupposedly a highly industrialized, technical economy. Neither Russia nor, later China had this. The, ah, excesses that occurred in both countries, in the mid-Twentieth Century, were the result of efforts to rectify this. You follow me? The Party, in power as a result of the confusion following in one case the First World War, and in the second case, the Second World War, tried to lift the nations into the industrial world by the bootstraps."

The colonel cleared his throat. "Let us say that some elements resisted the sacrifices the Party demanded—the peasants, for instance."

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Joe said, dryly himself, "If I am correctly informed on Sov-world history, you do not exaggerate."

"Exactly. Let us admit it. Stalin, in particular, but others too, both before and following him, were ruthless in their determination to achieve industrialization and raise the Sov-world to the level of the most advanced countries."

Joe said, "This isn't exactly news to me, colonel."

"Of course not. Bear with me, I was but making background. To accomplish these things, the Party had to, and did, become a strong, ruthless, even merciless organization, with all power safely—from it's viewpoint, of course—in its hands. And, in spite of all handicaps and setbacks, eventually succeeded in the task it had set itself. That is the achieving of an industrialized nation."

The Hungarian pursed his lips. "But then comes the rub. Have you ever heard, Major Mauser, of a ruling class, caste, clique, call it what you will, which stepped down from power freely and willingly, handing over the reins of government to some other element?"

Joe vaguely remembered hearing similar words from some other source in the not too distant past, but by now he was fully taken up by the astonishing Sov officer. He shook his head, encouraging the other to continue.

Kossuth nodded. "They tell me that in ancient Greece and Rome, tyrants or dictators would assume full powers for a period long enough to meet some emergency, and would then relinquish such power. I do not know. I would think it doubtful. But whether or not such was done in ancient Greece, it has been a rare practice indeed, since.

"A ruling caste, like a socio-economic system itself, when taken as a whole, instinctively perpetuates its life, as though a living organism. It cannot understand, will not admit, that it is ever time to die."

The Hungarian waggled a finger at Joe. "At first, when there was insufficient even of the basics such as food, clothing and shelter, Party members soon learned to take care of their own, explaining this deviation from the original Party austerity, by various means. Nepotism reared its head, as always, almost from the very beginning. Party members wished their children to become Party members and saw to it that they secured the best of education, and the best of jobs. And . . . how do you Americans put it . . . the practice of you scratch my back and I'll scratch yours, became the rule. Soon we had a self-perpetuating hierarchy, jealous of its position, and jealous of the attempts of outsiders to break into the sanctified organization. Marx and Engels wrote that following the revolution the State would wither away." The colonel laughed acidly. "Instead, in the Sov-world it continually strengthened itself. A New Class, as the Yugoslavian Milovan Djilas called it, had been born."

The Hungarian seemed to switch subjects slightly. "And a new development manifested itself. At first, Russia alone was of the Sov-world but as she became increasingly powerful, she exported her revolution, taking over in such advanced countries as, let us say, Czechoslovakia and East Germany. Here, supposedly, would have been the conditions under which the original ideas of Marx and his collaborator would have flourished, but the Party moved in its heavy bureaucracy and prevented any such development."

Bela Kossuth laughed gently. "Ah, ha, but this led to one of the ironies of fate, my friend. Because as the Sov-world expanded its borders it assimilated peoples of far more, ah, sharpness, shall we say? than our somewhat dour Russkies. In time, bit by bit, inch by inch, intrigue by intrigue—"

"I know," Joe said. "The capital of the Sov-world is now not Moscow, but Budapest."

"Correct!" the Hungarian beamed. "At the very first, we Hungarians tried to fight them. When we found we couldn't prevail, we joined them—to their eventual sorrow. However, the central problem has not been erased. We have finally achieved, here in the Sov-world, to the point where we have the abundant life. The affluent society. But we have also reached stagnation. The Party, like a living organism, refuses to die. Cannot even admit that its death is desirable."

He held his hands out, palms upward, as though at an impossible impasse.

Joe said, suddenly, "What's all this got to do with me, Colonel Kossuth?"

The Hungarian pretended surprise. "Why, nothing at all, Major Mauser. I was but making conversation. Small talk."

Joe didn't get it. "Well, why come here at all? Max said you were rather insistent about seeing me, in spite of doctor's orders."

"Ah, yes, of course." The Sov officer came to his feet again and clicked his heels. "My superiors have requested that I deliver this into your own hands, as well as copies to the West-world Ambassador, to General Armstrong and Dr. Haer." He handed a document to Joe.

Joe turned it over in hand, blankly. It was in Hungarian. He looked up at the other.

Lieutenant colonel Bela Kossuth said formally, "The government of the Sov-world has found Major Joseph Mauser, Dr. Nadine Haer, and General George Armstrong, *persona non grata*. As soon as your health permits, major, it is requested that you leave Budapest and all the lands of the Sov-world, never to return."

He clicked his heels, bowed again, and started for the door. Just as he reached it, he turned and said one last thing to Joe Mauser.

XXII

In spite of Nadine Haer's protests, Joseph Mauser insisted that they abide by the Sov government's expul-

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sion order on the following day. A special plane took them to London, and they there caught the regular shuttle to Greater Washington. At least, Joe, Nadine and Max did, General Armstrong remained on in London.

The flight itself was largely uneventful, Joe having retreated into his thoughts. He had a great deal to think about. Not only in regard to the immediate collapse of his mission, but both of the past and future, as well.

Max, looking out the plane's window as they took off, bore an air of nostalgia. "Look there," he pointed. "You can see that big statue of the Magyar warriors, there in front of the Szepmuveszeti Museum, like." He sighed. "I had a date with a Croat girl, to meet her there tomorrow night. I was making good time with Carla. She thought it was romantic, me being from the West, and all."

"Max, my friend," Joe growled. "Save us the lurid details of your romances."

But his voice hadn't really borne irritation. Max went on, "You know, you kind of get used to these people. They aren't much different, like, than us. Take fracases, for instances. They don't have them like we do, but they got their Telly teams out there in Siberia, with the lads that go chasing the rebels and all. And they got their duels they cover on Telly. But I was thinking, why don't they get modern and have real fracases, like us? And then we could have, like, international meets, and they'd send a division, and we'd send one, and have it out. Zen! That'd be really something to watch."

Joe winced.

Nadine said, "Max, it took the human race ten thousand years to put even a temporary halt to the international war, now you want to bring it back for the sake of a sadistic Telly show."

"Yeah, but gee—"

Joe Mauser said, "Max, go on back to the bar and have yourself a drink. I want to talk to Nadine."

When the little man was gone, Joe said, in a conversational tone, "We can be married tomorrow, right after we've reported to Phil Holland and the others."

Her eyes widened, "Well, really! Don't you think you might ask me about it?"

He shook his head. "No, we've covered all the preliminaries. The trouble with me has been that I've continued to look *up* at you. I suppose the caste system is too deeply ingrained in me. But now . . . you're my woman. Period. I suppose you've actually been wondering why I've been such a slow clod."

"Do you think you're looking *down* at me now?" She countered indignantly.

"No. Just evenly. We'll be married as soon as possible."

Her voice went strangely demure. "Yes, Joe," she said.

They drove immediately from the airport to the offices of Philip Holland, stopping only long enough for Joe to make a phone call.

They retraced the route over which Nadine had taken him that day that seemed so long ago, but actually wasn't. Through the long corridors, and eventually to the small office with the receptionist.

Miss Mikhail said, brightly, "Dr. Haer, Major Mauser, Mr. Holland is expecting you. Go right in."

Just before pressing through the door, Nadine put her hand on Joe's arm and looked into his face ruefully. "Darling, you've had so much hard luck in your time, I'm sorry this first assignment for the organization had to be a failure."

Joe wet his lips, carefully, "Why'd you think it was?" he said, opening the door.

Nadine could only stare as he ushered her into Phil Holland's presence.

That crisp, efficient operator made much the same motions he had the first time Joe had met him here. Holding a chair for Nadine, shaking hands briskly with Joe and motioning to another chair for him. While they were getting settled, Frank Hodgson sauntered in, seemingly as lackadaisical and disinterested as ever. After a minimum of exchanged pleasantries, he subsided onto the couch and fished for pipe and tobacco.

Holland took in Joe's arm, still immobilized in a sling, and the other signs of his wounds. He said crisply, "I thought that we had removed you permanently from the field of combat, Joe."

Joe said sourly, "Some of the Sovs thought otherwise."

Holland said, an element of irritation in his voice, "It is hard to understand how you could have revealed yourself so quickly."

Joe pursed his lips and looked at Nadine. He said, "I think I've figured that out. It's practically impossible for Nadine to dissimulate. And I've never seen her and her brother together but that they weren't arguing."

Nadine was frowning at him. "What has Balt to do with it?"

Joe said, "I have a sneaking suspicion that in the heat of one of your arguments with your brother, the Baron, you revealed your, and my, mission and its real purpose."

Nadine's right hand went to her mouth.

Joe finished with, "And the Baron, after all, is a member of the Nathan Hale Society. I have no doubts that the organization has some connections with their equal number in the Sov-world."

Holland grunted. "Very possible. However, it's done now. The thing is, what is your opinion Joe, and yours, Nadine, on the advisability of sending other operatives on the same mission?"

Joe shook his head. "Unnecessary."

Frank Hodgson paused in lighting his pipe, to peer through the smoke.

Joe said, "In fact, it was unnecessary to send Nadine and me."

Holland's voice was testy. "I assure you, Joe, the par-

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ticular assignment was quite important. We simply cannot afford to move, here in the West, until we know what the Sov-world will do. Your task was a delicate one, obviously. You simply couldn't go to their government and ask. There are strong elements in not only the Upper caste, but even the middle and Lower ones, here in this country, who would spring to the defense of present West-world society if they thought an attempt was being made to alter its structure. If the Sov government reported that it had been approached by elements of a revolutionary group, the fat would be in the fire."

Joe nodded. "I realize all that."

"You were expected to worm your way into their circles, to feel them out. To contact their own underground, if one exists. To ferret out definite information on how they would react if we began definite changes in the *status quo* here."

Joe continued to nod.

Holland was increasingly irritated. "Then why, good heavens, do you say your mission was unnecessary?"

"Because they had already sent a mission over here to contact us," Joe told him, evenly.

Had he suddenly got up from his chair, walked up the wall, across the ceiling, then down the other wall, they could not have stared at him the more.

The telly-mike on Phil Holland's desk squeaked something, and he took time enough to snap, "No. I told you, Miss Mikhail, I was not to be disturbed by *anyone*."

But Joe said, "If that's Colonel Lajos Arpád, I suggest you have him in. I took the liberty of phoning him and asking that he meet us here."

Frank Hodgson was the first to recover. "Arpád! That spy! I've just about gathered enough dope on him to have him declared *persona non grata* and ship him back to Budapest."

"As I was shipped back to Greater Washington," Joe said dryly. "Colonel Arpád and I seem to duplicate each other's activities in almost everything."

Phil Holland said crisply into the communicator, "Ask the colonel to come in, Miss Mikhail."

Ever the correct Sov-world officer, Colonel Arpád came to attention immediately upon entering the room, clicked heels, bowed from the waist. Except for Joe Mauser, none of them had met him, but he evidently knew all, greeting them by name.

The men had come to their feet. Joe said, "Meet Colonel Lajos Arpád, high in the ranks of the Sov-world Party, and at present on secret mission from the Sov-world underground revolutionary organization." Joe ended up wryly, "His mission being to determine what action the West-world might take if the secret group which has determined to make basic changes in the Sov-world socio-economic system was to take action."

It was the Hungarian who stared now. His eyes bored into Joe's face. "I do not, of course, admit that, Major Mauser. But where in the world did you receive that strange opinion?"

Joe sat down again. The blood he had lost still bothered him, and he tired easily.

He said, "From Colonel Kossuth, in Budapest. Another high ranking member of your group." Joe's eyes went back to Holland and Hodgson. Quick minded these two might be, but they were being asked to assimilate some shocking information.

Joe brought it all out. "I don't know why it didn't occur to any of us that the problems of the West-world and those of the Sov-world, at long last have become similar, almost identical. Both, following different paths, have achieved the affluent society, so called. But in doing it, both managed to inflict upon themselves a caste system that perpetuated itself, eventually to the detriment of progress. In the past, revolutions used to be accomplished by the masses, pushed beyond the point of endurance. A starving lower class, trying to change the rules of society so as to realize a better life. But now, in neither West nor in the Sov-world are there any starving. The majority of Lowers and Proletarians are well clothed, fed and housed, and bemused by fracases and trank pills, or their equivalent over there."

Joe shrugged, the weariness growing. Possibly Nadine had been right, he shouldn't have traveled so soon. "The best elements in both countries have finally realized that changes must be made. These elements, the more capable, more competent, more intelligent, already are *running* each country though they are not necessarily Uppers or Party members. Phil Holland here, supposedly a Middle secretary to the Foreign Minister, actually has performed that worthy's work for several administrations. Frank Hodgson is the working head of the Bureau of Investigation, though only a Middle. I assume a similar situation prevails in Budapest."

Arpád still stood. "It does."

Joe came to his feet, looking to Nadine. He said, "Gentlemen, I evidently have not recovered from my recent duel as much as I thought. I had better retire. Meanwhile, I suggest you exchange some notes."

Nadine hurried to his side, worried.

Holland, Hodgson and Arpád were staring at each other, somewhat like small boys, or strange dogs.

Hodgson grumbled, his voice, for once, forgetting to express laziness, "Our records show you to be a Sov espionage agent."

The Hungarian nodded, equally suspicious. "That is my official position. But I am also secretly a member of the executive committee of the organization of which Major Mauser speaks and have been attempting for some time to get in touch with the West-world underground, if one existed. I had about come to the conclusion that no such group was in existence, until today."

Joe said, "Relax boys, and let down your hair. You've got a lot in common. It looks as though, at long last, the Frigid Fracas is beginning to fade away." □

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ICEBERG FROM EARTH

The delicate business of balancing two enemies one against the other, while an economical way of handling both, requires some sharp awareness, and fast reactions . . .

by J. T. McINTOSH

ILLUSTRATED BY JOHN SCHOENHERR

"They're sending us a girl," Billjohn said.

"What for?" I asked.

"Not," he replied regretfully, "for any of the purposes which immediately spring to mind—which is a pity, for I understand she's remarkably attractive—but to instruct us in our job."

"What job?"

"Specifically, to make sure the *Mars* leaves here exactly as she arrives, and that nobody acquires any important information about her while she's here."

"So this girl is some kind of Intelligence expert?"

"Exactly," said Billjohn, pleased at having achieved communication.

"Why a girl?"

"Ours is not to reason why," he sighed. "She arrives on the ship this afternoon. Her name is Nova Webb. Now you know as much as I do, God help you."

"Want me to go and meet her?"

Billjohn smiled sadly. "And thus inform Pack Larner that Miss Webb is here to work with us? No, thank you. We'll meet her later today at a spot already arranged. I'll tell you where when you get back."

"Back from where?"

"Back from making yet another check on the land dock where the *Mars* will be berthed."

"Why do you keep sending me to look at a plain blank concrete hole in the ground?" I demanded with some heat.

"To make Larner think it might be something more. To puzzle him and prevent him sleeping nights."

I shrugged. "I think we're wasting our time."

"How so?"

"There's no indication that Coran means to try anything against the *Mars*. There's not even any indication that Coran means war in the near future."

"Why kick when you're looking for trouble and fail to find it?"

Billjohn was a fat, indolent ex-policeman who had found himself, rather against his will, placed in charge of Marlock Intelligence on Rham. He wasn't a bad boss to work with except that as his chief deputy I had to do all the legwork for us both. And the state visit of the *Mars*, although she wasn't due for some days yet, had already meant a lot of legwork and would probably mean more.

If I had guessed how much more, I'd have fainted.

Despite any false optimism, Coran could be confidently expected to try something—and though we had so far failed to come up with any idea of what it might be, we'd be expected to counter it. Naturally.

"O.K.," I said. "I'll go look for trouble and hope I don't find it."

"Please be most careful that you don't find it," said Billjohn gently. He was reaching for a box of candy as I left.

The apparent tangle of Naroonian politics is remark-

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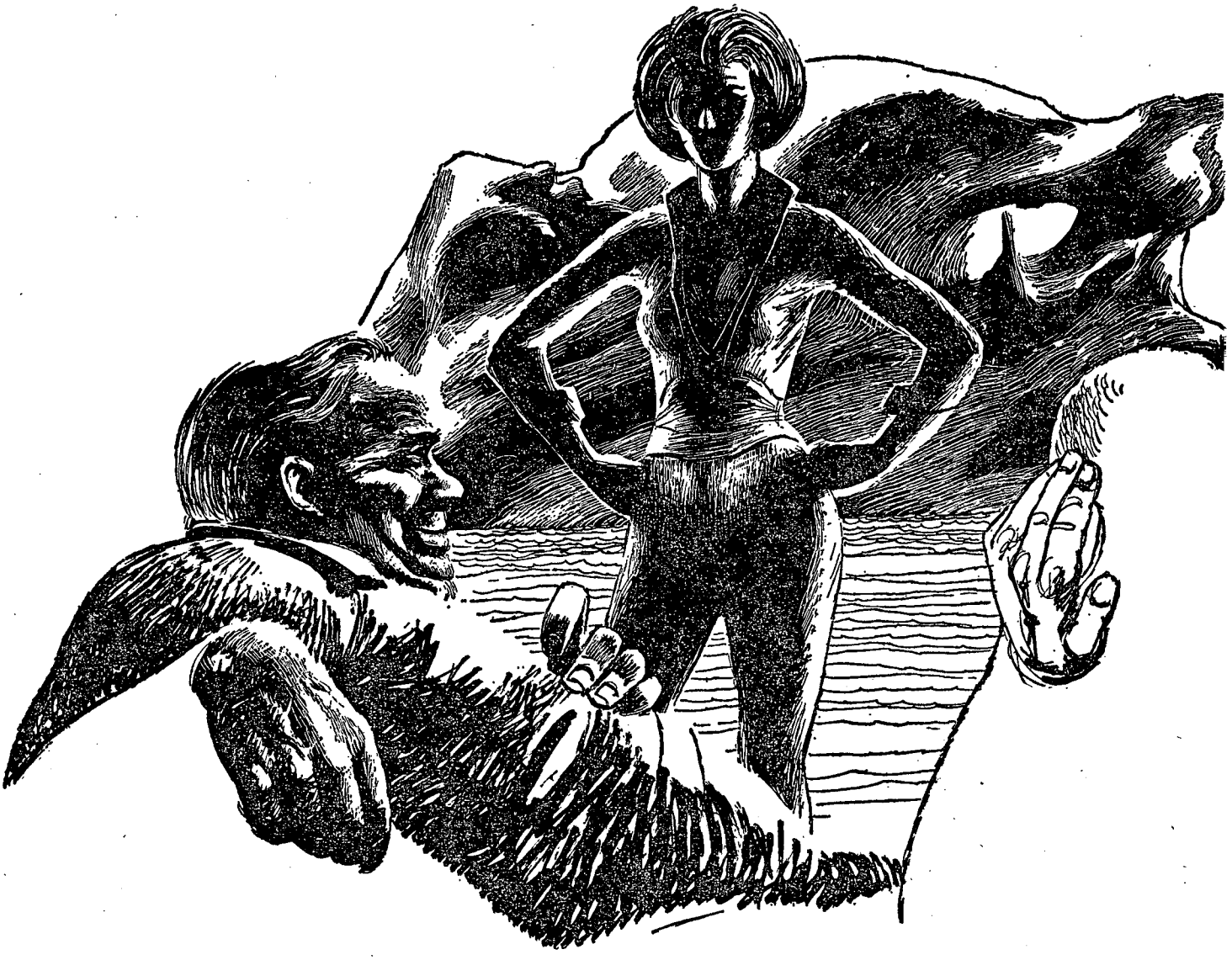

ably simple if you stick to essentials and ignore all the protestations of innocence and fraternal love.

Naroon is the sun, Sol-type and not much smaller. The three planets, from Naroon out, are Rham, Marlock and Coran, all Earthworlds and all colonized.

Rham, the hottest, was colonized first and is the richest and most populous—so rich and populous that in all the many wrangles between the two outer planets Rham stays fatly, comfortably neutral, selling to both, making plump profits out of both, and becoming even richer and more populous. Neither Marlock nor Coran likes Rham very much but that's the way it is.

Marlock is a temperate world with too little landsurface. Gradually we're making more in the warm regions, but it's a slow business and we'll always be particularly vulnerable to attack. The kind of world which is least enthusiastic about being attacked is a world on which most of the population lives on stilts over water.

Coran is a cold world where only on the equator is life reasonably bearable. Coran envies Marlock, and Rham.

So in this three-world system too far from other human-occupied worlds to be greatly affected by them, Cinderella not only has looks but everything else as well, and the two ugly sisters are literally out in the cold.

There's just one other thing that must be understood. Although the Naroonian worlds are independent and likely to remain so, there are few pies into which the mother world Earth can resist sticking a finger. To keep the balance of power in Naroon—in other words, to prevent the system from becoming even potentially dangerous to Terran interests—Earth long ago found the magic formula—back Marlock. Not enough to displace Rham as the comfortable, complacent boss-world in wealth, technology, power and everything else. Just enough to keep Rham and Coran in their place, without encouraging Marlock to get too far above hers.

Terran technicians had helped Marlock to build the *Mars*, a warship more powerful than anything even Rham could aspire to. Now Earth was sending us an Intelligence expert, this Nova Webb, to make sure we

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didn't fall down on the job on guarding the *Mars* and her secrets.

Privately I thought Earth hardly needed to trouble herself. Captain Thorson and the one-hundred-twenty-man crew of the *Mars* were quite capable of looking after the safety of the warship. As for the technical secrets of the *Mars*—even we, with the ship in our possession, were incapable of duplicating her. So how could anything that Pack Larner managed to find out do Coran any good?

Nobody paid much attention to me as I strolled along the broad, blinding avenues of Rham City to the spaceport, adjusting my stride to the usual Rhamian amble. After three months in and around Rham City I had a tan indistinguishable from that of the locals, and in slacks and a T-shirt I looked as Rhamian as the Via Naroonia itself. The snag was that any Coranian agents operating on Rham could be guaranteed to look just as Rhamian as I did.

There was no denying that Rham City was beautiful. Built on a friendly world mysteriously devoid of life until the first human colonists came, it had no excuse to be anything else. The avenues were wide and flat, the white buildings graceful and set well apart from each other.

If there was one thing both Marlock and Coran envied more than any other about Rham City's situation, it was the surfeit of space. To the north and east of the city, flat, firm scrub stretched limitlessly, ready to be developed whenever necessary with the minimum of effort. A few acres of such ground on Malock or Cocan, even without Rham's wonderful climate, would have been worth millions. And the Rhamians left thousands of square miles of it doing nothing because they weren't within centuries of needing it yet. To the south was the Gresham River. To the west was Little Sahara, a desert of golden sand which was used by the Rhamians as a playground.

The natives were friendly. They were too sure of themselves to be anything else. Although immigration from Marlock and Coran was strictly limited, anyone who liked could come to Rham City and stay as long as he liked. Rham had nothing to hide.

So Rham was a kind of Switzerland, headquarters of the main Coranian and Marlockian Intelligence services. Although the two outer worlds were not currently at war, the peace was so suspicious and uneasy—it generally was—that Coranian agents sent to Marlock itself, and vice versa, were speedily hunted down and executed. Thus, though agents sent to Rham could not be particularly secret nor could they learn anything at first hand, at least they learned something and survived to report it, more than could generally be said of the heroes and heroines of the cloak and dagger divisions.

The Rham City spaceport was huge and devoid of all pretension to strict military security. The Rham Navy yards to the east were guarded, of course, but not very seriously. With a long focus camera you could photograph anything you wanted to, and I already had.

The berth which was to take the *Mars* stood empty in the middle of a square mile of nothing. This was by request of the Marlock Navy. The Navy preferred to be responsible for its own security instead of having to pretend to depend on the Rham authorities.

"That's where the big warship's going to be, isn't it?" a voice said behind me.

"Yes," I said, and turned slowly. A young Rhamian—or Marlockian or Coranian—in shorts and a silk shirt was surveying the empty berth with mild interest.

"You got something to do with it?" he asked.

"Yes, I'm from the Marlock Embassy."

"Marlock?" the youth said, puzzled. "I thought the ship came from Coran."

"No," I said patiently. "She's ours. From Marlock."

"Why do you call the *Mars* 'she'?"

"Ships are always 'she' even if they have masculine names."

"Oh." He wandered casually away. No rudeness was intended—Rhamians were casual about everything.

Well, not quite about everything. They'd hardly have held their leadership among three rapidly growing, pushing worlds if they were quite as casual as they seemed to be. The national character of Rham is to be efficient at one thing, usually but not always their job, and careless about everything else.

They're said to be the most sexually promiscuous people in the galaxy. Whether this is so or not, I wouldn't know—not because I don't know how sexually promiscuous they are, but because I've never been outside the Naroonian system. All I do know is, there are no Rhamian prostitutes.

Why the *Mars* was visiting Rham at all was outside my orbit, but it was easy to guess. It was a flag-waving affair, a reminder to the casual, promiscuous, wealthy Rhamians that Marlock possessed the most powerful and deadly weapon this side of Earth. Up to now the ordinary private citizen of Rham had been able to believe, if he felt like it, that the Marlockian super-ship was a myth. After the *Mars* had towered over Rham City for four days, anyone still capable of believing she was a myth would be in a bad way.

"Hi, Smith. Expecting trouble?"

I turned again, already knowing I was going to see Pack Larner, my opposite number. He was older than me, taller, thinner, and his eyes were black buttons. I wouldn't have liked him even if it hadn't been part of my job not to. Strictly he wasn't my opposite number but Billjohn's. However, since Billjohn rarely budged out of his office chair, I was the one who came in contact with Larner, the Coran Intelligence boss on Rham.

"My day hasn't been wasted," I said dryly. "So Coran is taking an interest?"

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"Coran always takes an interest in anything Marlock does," Larner said.

"Quite right, too. You may learn something. All things are possible—even that."

"I'll give you due warning, Smith," said Larner softly. "If you're expecting trouble, you're not going to be disappointed."

I looked at him narrowly. I'd be the last man on Rham to underestimate Larner. Why should he warn me? Did Coran have other fish to fry, fish of such importance that Larner could afford to drop a threat about the *Mars* as nothing more than a red herring?

"So you're going to blow up the *Mars*," I said.

"Who said anything about blowing her up?" he said. "After this visit we're going to have a complete set of blueprints, Smith. And in a little while we'll have a *Mars* of our own. There's not a thing you can do about it, you or your fat, lazy boss. Make what you like out of that."

And he, too, strode away across the field.

I didn't make anything out of it.

Exactly how our meeting with Nova Webb later that day had been fixed up was not revealed to me. Billjohn talks a lot without saying very much. The important thing was that we made quite sure nobody followed us or overheard us. We met in a dingy room containing three chairs and nothing else.

"Pleased to meet you, Miss Webb," Billjohn said, and we were.

She was tall and fair, too pale and icy to qualify as a sexpot among the tanned lovelies of Rham, but an object of supreme interest to any man who liked hard-to-get women. She was superbly shaped and she wore what was presumably the latest Terran fashion in silk suits. It was blue and it was startling because it concealed so much without denying a thing.

"We'll get straight to business," she said briskly. "Unless anything has happened in the last two weeks, you can take it I'm as well-informed about the whole situation here as you are."

"All that's happened," I said, "is that Pack Larner told me today Coran would have a complete set of blueprints when the *Mars* left here."

"Interesting," she said. "That's all?" She didn't sound interested.

"Yes," I admitted. I'd have given a lot for some item that would really have rocked her. That's the kind of girl she was.

"I propose to find out first," she said, "whether Coran has any immediate intention of opening hostilities on Marlock. I won't need any assistance. I'll meet you again here on . . . Tuesday?"

That was the day the *Mars* was due.

"It will be quite easy to find this out?" Billjohn said mildly.

"Oh, yes. Frontier worlds are never very subtle."

"It will be very interesting to hear what you have say on Tuesday, Miss Webb."

My fat boss was drooling with the fatuous certainty of most plump, middle-aged Lotharios on meeting a pretty girl that if they'd met her twenty years ago she couldn't have failed to succumb to their charm. "You're staying here openly as a Terran?"

"Why not? There's nothing to stop Terrans going anywhere they like in Rham City."

"But Earth's pro-Marlock bias is well known. Larner will check on you as a matter of course."

"The report he'll get will be that I'm acting as an ordinary Terran tourist. You will not contact me until Tuesday. I'll be here at 10:30."

That seemed to be that.

In the next few days I saw Nova Webb several times, because although Rham City was pretty big, the pools, beaches, restaurants and bar lounges which were currently in fashion were a small, select group, and she appeared only in the fashionable places.

She was certainly acting like an ordinary Terran tourist.

The first time I saw her she wore dark glasses, sweater and slacks and was just leaving one of the artificial beaches. In her cover-up outfit her figure looked so promising that I greatly regretted not having seen her half an hour earlier.

The next time I did see her half an hour earlier, at one of the pools. She wore a wisp of nylon at her hips and two frilly cups over her breasts, and such was her cool, clinical physical perfection that she looked fully dressed. As I surveyed her I showed nothing beyond the respect which the revelation deserved. We might need an Intelligence expert from Earth to teach us our job, but we weren't foolish enough to inform any Coranian agents who might be watching that Nova Webb was working for us.

The third time I saw her I began to wonder if she was working for anybody. For the third time she was completely alone, and for the second time she was idly scanning a newspaper. Then she threw it in a waste basket and sauntered along the Via Naroonia, looking about her with the icy interest of a tourist who liked what she saw but not very much.

The fourth and last time she was again alone, again by a pool, again reading a newspaper. That she could stay alone if she wanted to, even with her looks, was no surprise—the icy types always can. But why should she want to? She was trying to find something out. You don't find things out by not talking to anybody.

Anyway, when Billjohn and I met her again she had already acquired a Rhamian tan with the aid of fast-tanning oils, but she was still deliberately and obviously Terran. Personally I doubted if she could have pretended to be a Rhamian girl if she tried. It takes more than a brown coat to make an iceberg look warm.

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Guessing my thoughts, she said coldly: "In Intelligence, Mr. Smith, one of the first laws is to keep information and action strictly separate. An agent either finds things out or acts on the information someone else has acquired. Never both at the same time. I've been looking for information, and I can get it as Nova Webb, from Earth. It's quite unnecessary for me to carry a stick and wear a false beard."

"Did you get what you were looking for, Miss Webb?" Billjohn asked politely.

"Quite as easily as I expected. As I told you, frontier worlds aren't subtle."

"Is Coran planning war, then?"

"Yes, and fairly soon."

We were quite sure this was only a guess. Having spent her time as she had been doing, what could she do but guess?

"I see I'll have to explain in words of one syllable, or less," she said. She took a newspaper clipping from her bag. "This is from a page of trade advertisements. Rham supplies the outer worlds with fruit, electronic apparatus, manufactured goods and books. Marlock trades in oil, coal, steel and other minerals. Coran advertises a large range of materials including ceramics, papers, plastics and resins."

She took out her lighter and set the paper on fire, holding it until it was well alight and then grinding the ashes under her heel.

"Thank you very much, Miss Webb," said Billjohn happily. "The significance of what you've just said escapes me, but you have a lovely voice."

"You really are remarkably obtuse," said Nova coldly. "Don't you know *anything* about Intelligence?"

"Evidently not," Billjohn sighed. "Please tell us about Intelligence, Miss Webb—employing, of course, words of one syllable or less."

"Fortunately, Coran doesn't know anything about Intelligence either. Or images, understandably, that Marlock has none. Having these resins for disposal, Coran has no more sense than to attempt to sell them, quite openly—although their availability makes it obvious to anyone but a nitwit that Coran is preparing for war."

Billjohn stared at me and I stared at him. Receiving no help from either quarter, we turned blank gazes back on Nova.

"Rocket fuels," she said clearly and distinctly "You manufacture large quantities of various rocket fuels. As by-products you then have for disposal resins AH 12/B, FS 17/S and FX 29/T. If you are as naïve as Coran, you openly try to sell them. And if you are as moronic as Marlock you fail to see any significance in the fact."

Billjohn and I looked at each other to see if there was any chance of pretending we'd known that all along. Reluctantly we both decided there was none.

"A world which is manufacturing large quantities of rocket fuel," Nova explained as if to children, "obviously has no intention of embarking on interstellar exploration. The purpose can be nothing but large-scale transportation of troops and materials over relatively short distances. And you don't begin stock-piling rocket fuel until fairly soon before the anticipated delivery date."

She stopped. There was no need to explain further to us. We got the message.

"But . . . steel," I said. "Coran has always been short of metal. So is Rham. That's why it's been worth our while to mine the sea-bed. We export to Rham and Coran has to re-export—"

"We are all well aware of this, Mr. Smith," Nova said. "The inescapable conclusion is that Coran has discovered large iron ore deposits at last. She's not quite silly enough to advertise steel and the associated by-products for sale to Rham, because—"

"Yes!" said Billjohn, excited for once. He was aghast, too. "Rocket fuel without steel . . . no, that would be useless. So there must be steel available, as you say, Miss Webb. And that means—"

That meant, quite simply, war. Coran fought Marlock, or had done in the days before we had the *Mars*, every time she had managed to stockpile enough steel and iron at the ruinous prices she had to pay Rham for it. We sent Rham all the steel she asked for—we needed the money. We did not sell direct to Coran, any more than you would sell a knife to a man who had openly expressed his intention of cutting your throat. But Coran bought our steel from Rham, and Rham got still fatter on the proceeds.

"There's one way we can test this," I said. "Get the Marlock mining companies to offer Coran steel shipments direct. If they don't accept the offer, we'll know what to—"

For the first time I heard Nova Webb laughing. It was a cool, mocking sound. "If they didn't accept the offer, of course we would know," she said. "Would you expect them to refuse? Since they have taken so long to find it, we can assume their iron supplies are very hard come by. Offer them metal and they'll accept in half a second."

"Then what do we do?" I said.

"You take good care of the *Mars*. Obviously Coran means to eliminate the ship, not attempt to steal her secrets. Without a ship to stand against the *Mars*, all the steel in the galaxy won't do Coran the slightest good. Without the *Mars*, Marlock might as well surrender to Coran without futile resistance."

"Have you any plans?" I asked humbly. She did have a brain, this girl. She had a remarkable brain to go with her remarkable body, and though there was no evidence so far that any real feminity went with them, that didn't stop her being an excellent Intelligence agent. Rather the reverse.

She smiled frostily. "Intelligence and action, remem-

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ber? Intelligence is my department. Action is up to you. However, if you meet me here again tomorrow, after the ship is here, I may have something to suggest."

Everybody in Rham City watched the *Mars* land that afternoon—and even the people who were determined not to be impressed were impressed.

The *Mars* was the largest and most powerful warship in existence. Even Earth had nothing to match her—though Earth could easily send up a fleet of smaller ships which could destroy her at a certain cost to themselves. But this was an academic point, for the *Mars* had no interstellar drive. Had she been intended for interstellar flight, she wouldn't have been built half as large.

She would never see service beyond the Naroonian system.

I might not be as bright as Nova Webb, but I had long ago figured out for myself that Earth's motives in helping us to build one huge warship which we couldn't duplicate ourselves, and our own interests, might be equal to the same thing without being equal to each other.

To Marlock the *Mars* was both a blessing and an enormous liability. We were rather in the position of a chessplayer with a queen, and certain other pieces undeveloped, against a player without a queen but with all his pieces developed. Invulnerable though we were in theory, we could not risk losing our queen.

In practical terms, we could never pick a quarrel with Rham, because Rham, probably at enormous cost to herself, could knock out our queen eventually and then mop us up with whatever happened to be left. We were always reluctant to be cast as the aggressor even against Coran, for Coran *might* damage the *Mars* and therefore be able to destroy her. Then we'd be finished, for Coran did not depend on possesion of one supreme weapon and we did.

But meantime we still had the *Mars*, and even the complacent Rhamians gaped as she landed.

Other things being equal, size generally means power. A tiny armed motor cruiser from the Twentieth Century would be more than a match for a seventy-four-gun ship of the line from the Nineteenth—but helpless against anything bigger than herself in her own time. And the *Mars* was big. The secret of her size was imperfectly understood by our own scientists. It had been the Terran technicians who had built the reinforcing magnetic-antigrav network which gave her stability and prevented her from collapsing under her own weight. The Terran technicians, too, had produced a normal-looking power unit that was capable of driving a ship four times larger than anyone could expect it to drive.

The *Mars* was descending slowly and cautiously, every moment becoming more impressive. A huge ship a mile away is very like a tiny ship four hundred yards away. As the *Mars* dropped, she grew and grew and grew.

Billjohn was with the official reception committee. Theoretically he was only an unimportant member of the Embassy staff, and he stood out on the field among the Marlockian messengers, typists and drivers mustered to make an imposing phalanx behind the ambassador waiting to welcome the commander of the *Mars*.

After the public ceremonies, however, Billjohn would have an extremely private conference with Captain Thorson. He would stress the importance of maintaining the strictest possible guard while the *Mars* was on Rham. And we knew already what Thorson would say. He would say that Coranian saboteurs could do their worst, but they wouldn't succeed in mussing up the sheets in any of the bunks or spoiling the taste of the coffee.

The trouble was, did Thorson have as much imagination as Coranian Intelligence?

Me, I was watching Pack Larner. I didn't see the warship actually land and I missed all the ceremony of polite, lying statecraft. I didn't reckon I was missing much, at that.

I had done a neat job on my face with pads in my mouth and fleshwax to change the shape of my ears and nose. Whoever I looked like, I didn't look like me, and it didn't matter whether Larner got a good look at me or not, for I couldn't put on the same face again if I tried. This was a face for one showing only.

I wasn't particularly interested in the assignment until

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I realized that while I was watching Larner he was watching somebody else, and even then I didn't flip until I saw that it was Nova Webb he was watching.

She was no longer solitary. Not only was she being jostled by a crowd, she was talking to another girl, a brown brunette who looked as warmly passionate as Nova was icy.

Larner wasn't supposed to know anything about Nova. If he knew enough to keep an eye on her, what else might he know?

The *Mars* was down now, in her predetermined position in the berth to an inch. The ceremonies were in full swing. Although what was happening around the vast fins of the warship was being covered by television cameras and relayed all over Rham, the people only just out of earshot on the field found that there was nothing more to interest them. The first Marlockians having emerged from the hollow fin, there was nothing to look forward to but the sight of more and more green-uniformed men emerging.

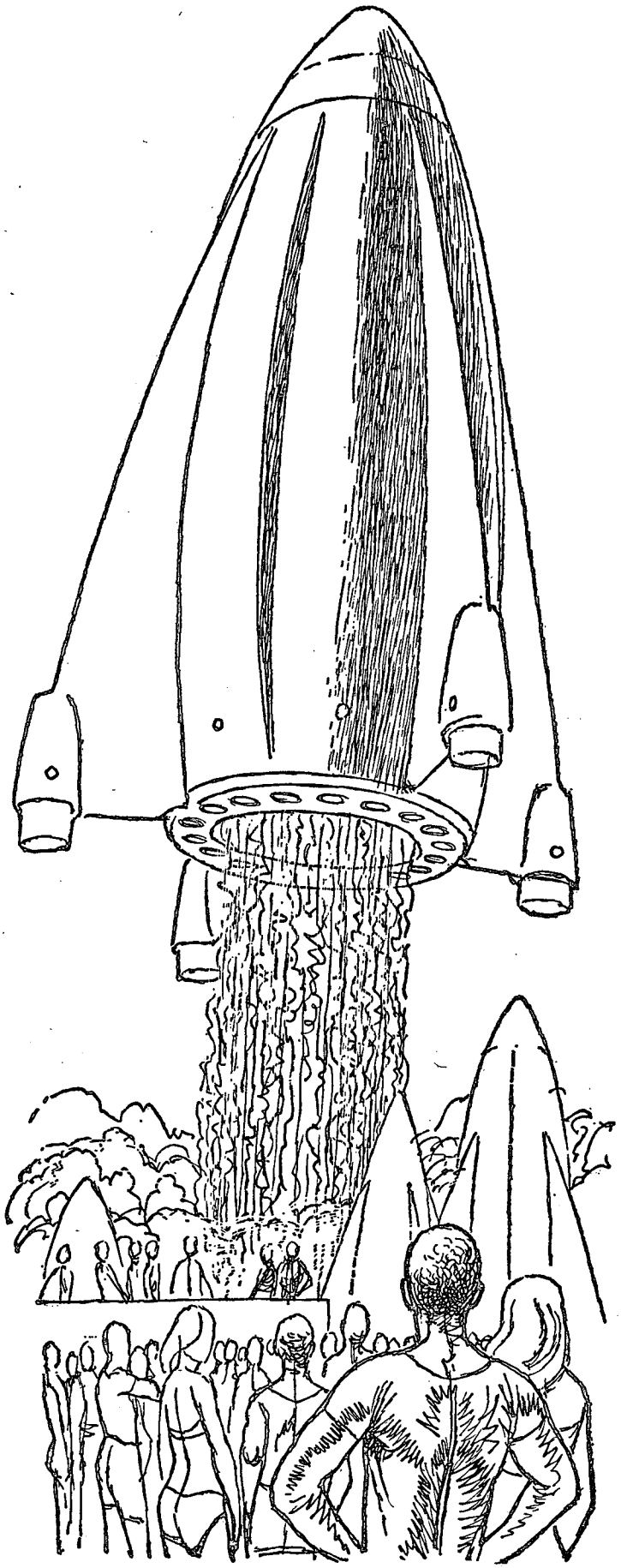
With a last look at the enormous bulk of the warship, her huge hull dull and pitted yet all the more impressive for that, people began to drift from the field. One of the first to lose interest was Nova Webb. She sauntered away, the brunette still with her. Larner sauntered after them. I sauntered after Larner.

The two girls sat at an open-air table outside one of the smart cafés on the Via Naroonia and drank iced lemonade. Larner drank lemonade, too. I stayed on the other side of the avenue and pretended to be waiting for my girl.

It seemed for a moment as if the brunette, apparently only a chance acquaintance of Nova's, was going to leave her at the café table. The brunette stood up and gave all the indications of going on her way, but then Nova stood up, too, and they strolled on together.

The procession resumed.

I was glad Nova had stuck with the brunette, or vice versa, for while she was with her she wouldn't do anything important or significant, anything we wouldn't want Larner to see her do. If it hadn't been for the brunette, I'd have had to consider warning her that she was being watched.



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I knew, although Nova hadn't told me, that she was staying at the Astoria Hotel. So I wasn't surprised when she cut off the Via Naroonia through one of the parks. She was returning to the Astoria by the straightest route, taking the brunette with her.

Larner followed the two girls and I followed Larner. My sixth sense just wasn't working that day, I guess. For when I was cut down by a stun gun I hadn't had the faintest breath of warning. I didn't even know I'd been stunned until I woke up.

Nova and I woke up more or less together, and we saw we were all untidily deposited on the dusty floor of a large helicar. When I say all I mean all—Billjohn was there, and Nova, and the brunette, and me. Larner had swiveled his seat round to face us, and without moving I could see that the stun gun in his hand was set to drop any or all of us before we had moved a foot.

Nobody did any talking, although we were all fully awake except the brunette. What was there to say? Threatening Larner, yammering at him "You won't get away with this!" was pointless, and saying anything else might tell him something he didn't already know. So we sorted ourselves out, sat up and otherwise waited for Larner to make a move.

Larner didn't make a move because he wasn't ready. There was another man piloting the helicar, and that left Larner free to devote his entire attention to us. He didn't need any help, not with a stun gun.

It wasn't as bad for me as for the other two, because I never had any dignity or any sense of my own importance. There was stark disbelief in Billjohn's eyes. This couldn't be happening to him. As for Nova, her eyes were at absolute zero as she speared Larner with them. Her stockings were ruined, her smart blue suit would never be the same again, but this was nothing to the wound inflicted on her pride. People didn't do this kind of thing to Nova Webb. Didn't Larner know that her specialty was Intelligence, not action? He was breaking the rules.

Then the brunette sat up and the sound came on.

She took one quick look round and started to get up.

"Stay where you are!" Larner snapped.

"Who are you?" she demanded, more puzzled than angry. "Police? Did we get mixed up in some demonstration against that warship, or something? Was I knocked out?"

"You were knocked out with this," Larner said, indicating the gun. "There will be no ill effects if you behave yourself."

The girl met Nova's eye. "Nova," she said, "do you understand what this is all about? Who's that man? What are we doing in a helicar? Who's the fat man, and who—"

To get her name, I said: "George Smith, at your service." I hadn't checked whether there was any of my disguise left, but I knew it no longer served any purpose anyway. Larner knew who I was. He had known all along that I was tailing him.

"Pauline Pratt," she said automatically. "Nova, can't you tell me . . . ?"

"I know no more than you do," Nova said. "I've no idea what—"

"That won't do, Miss Webb," said Larner. "I know you're a Terran agent working for Marlock. As for you, Miss Pratt, I admit it may be possible that you have no idea what's going on—If by any chance that's so, it's just your bad luck that you got mixed up with Nova Webb."

"Mixed up with her?" said the girl, getting angry. "I happen to be staying at the same hotel, that's all. She and I went to the spaceport to see the warship. Now will you please land and let me get out?"

Billjohn spoke for the first time. "It may save a lot of unnecessary talking," he said sadly, "if I tell you that Larner has already informed me what he's going to do with us. He's going to land us in the middle of Little Sahara." He rolled a lugubrious eye at me. "I presume you were not responsible for the message which took me to the Naroonia Gardens? I wouldn't have thought for a moment you were, only the messenger did give this week's code word."

Abruptly the helicar started to descend. Pauline Pratt was still protesting, but nobody was listening to her. If Larner proposed to drop us in the middle of Little Sahara, that was exactly what was going to happen to us, and we could save our breath. I didn't like him any more or any less for what he was doing: if he had plans that demanded our non-participation for five days, dumping us in the desert was about what we could expect if we let him catch us, and we had. Keeping us prisoner in the Coran Embassy wasn't practicable; the Rhamian police, if we were reported missing, might request the Coranian ambassador to prove that we were not there.

Then I had another look at Larner and decided I did like him less. For he was going to enjoy leaving us in the desert, and he didn't bother to hide it.

The helicar was down. The pilot stayed immobile with his back to us so that we didn't get a look at his face—not that it mattered.

Larner opened the door and gestured with his gun. The alacrity with which Billjohn climbed down and I followed showed, I guess, that we had the best grasp of the situation. Nova followed slowly and reluctantly, still trying unsuccessfully to freeze Larner with her eyes. Pauline, still protesting angrily, incredulously, stepped down only when Larner finally convinced her that if she did not he would stun her and push her out.

Larner jumped down after us, still with the gun.

"Your coats, please," he said.

"Huh?" I said, though I knew exactly what he meant.

With some protection against the sun you could at

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least try to cross Little Sahara in the full heat of day. Without it, you had to travel only by night. Hot, blinding sun is fine when you can take it or leave it, when you can sunbathe on an inflated mattress and roll under a striped umbrella when you've had enough. When you have a five-day trek across desert in front of you, you'd trade sunshine for rain and mist any time.

Billjohn met my eye ruefully and stripped off his coat. I followed suit. We didn't expect Larner would be satisfied, and he wasn't. He took our pants as well, but left our sandals.

Nova surrendered the jacket of her suit. I thought he'd have to stun her to get her stripped further. However, when she saw there was no help for it she peeled to her bra and pants.

Pauline said: "This has gone far enough. I know you. You're from the Coranian Embassy. I'm a Rhamian, and I've never been to either Marlock or Coran. These quarrels between you are nothing to me. If you don't take me straight back to Rham City—"

It would have been interesting to hear what the alternative was, but we never did. Larner stunned her and when she slumped on the sand in the shadow of the helicar, leaned down and ripped her clothes. For a moment I thought he was going to leave the torn cloth where it was, but this was wild optimism. He threw it all inside the car. He wasn't going to leave us anything we could use as sun helmets.

Before the helicar took off, he dropped out four water bottles and a compass. We were grateful for that much.

"The first thing I'm going to do when I get back," Billjohn said with more concentrated venom than I had ever heard in his voice, "is dump Larner and two of his agents right in this spot."

"How pointless," Nova said distantly.

Pointless on the face of it, but understandable if you knew how the Marlockian and Coranian Intelligence services on Rham operated. The Rham cops left us alone as far as possible, on the understanding that whatever we did to each other we wouldn't harm or inconvenience Rhamians. Since Rham refused to listen to complaints by Malockians against Coranians and vice versa, a tacit, unwritten understanding had to be reached, and had been reached long ago. It was simple: an eye for an eye, and a tooth for a tooth. If a Marlock agent got sapped, a Coran agent got sapped. If a Coranian wound up dead, a Marlockian wound up dead.

This was mutually understood and it kept the private war on neutral soil within bounds. Larner must have known that if he had us killed, an equal number of his own men would be killed. He probably knew, too, that Billjohn's reaction to being dumped in Little Sahara would be exactly what it was. Of course, by the time we got back there would be no particular advantage to us in giving three Coranian agents a five-day hike. It was, as Nova said, pointless.

But to keep the *status quo* Billjohn would do it.

"How far to Rham City?" Nova demanded.

I resisted the impulse to remind her that she was as well-informed about the whole situation as we were. "Something over a hundred miles," I said. "If we really are in the center, that is."

"Three days? Four?"

"Without sun helmets, five. Twenty miles a day is good going."

"We can't afford to take five days. That would mean we wouldn't get back until the *Mars* had left. We simply have to do the trip in four nights, and assume that whatever Larner's trying to do, he hasn't been able to do it by the time we get back."

Billjohn nodded. More calmly he said: "Fortunately, there's a good chance of that. I don't think Larner will try to blow up the *Mars* in her berth in Rham City. To do really serious damage he's need an explosion that would wreck half the city. Rham wouldn't stand for that—and Coran can't fight Rham as well as us. So—"

"So there's a good chance," Nova said impatiently, "that Larner's plan, whatever it is, is aimed at destroying the *Mars* after take-off. That's elementary. Meantime we've got to make up our minds whether we head due east as fast as we can or not."

"How do we know Larner dropped us in the middle? Why not at the western edge of the desert?"

It was Billjohn who answered. "No, Miss Webb. There are farms all around Little Sahara, which is roughly circular. Consequently there are many helicar flights round the edges. Larner would not take the risk that we might be seen and picked up. Helicars do not cross the desert, however, being unable to travel on sand should they be forced to land. We may, perhaps, be spotted by a plane—"

"And what sort of chance is that?"

"Poor, or Larner would have chosen some other way of putting us out of circulation. There are no regular flights across the desert. Most of the other Rhamian cities are to the north and south, not west or east. I think we can take it that Larner told us the truth."

Nova was not satisfied. "I hate doing exactly what I'm expected to do. Suppose we made for one of the farms?"

Billjohn shook his head. "Near the city, as you know, there is far more chance of being seen. If we travel in any other direction, we may reach the edge of the desert and still have to walk many miles—"

Nova capitulated with poor grace. "All right," she said. "One more thing. The fact that Larner disposed of the three of us is a clear indication that we are the ones he most fears. He expects to defeat the *Mars* captain's own routine precautions. I'm going on the assumption that it is my special knowledge which Larner particularly fears."

Of course she would. How could Billjohn and I matter? We were peasants. We couldn't read or write or count beyond ten.

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We all looked down at Pauline. In the black bra and pantie-girdle which was all Larner had left on her, she showed up as older and considerably heavier than she had seemed in her cunningly-cut dress. She would have been glad to weigh at least twenty pounds less, I guessed.

As we looked at her, she opened her eyes and sat up. "The car's gone?" she said blankly.

"As you see," said Nova briefly.

Pauline's eyes fell on the water bottles. "Where's the food?" she asked.

"What food?"

She jumped to her feet. "You mean he's left us without food? We'll starve to death!"

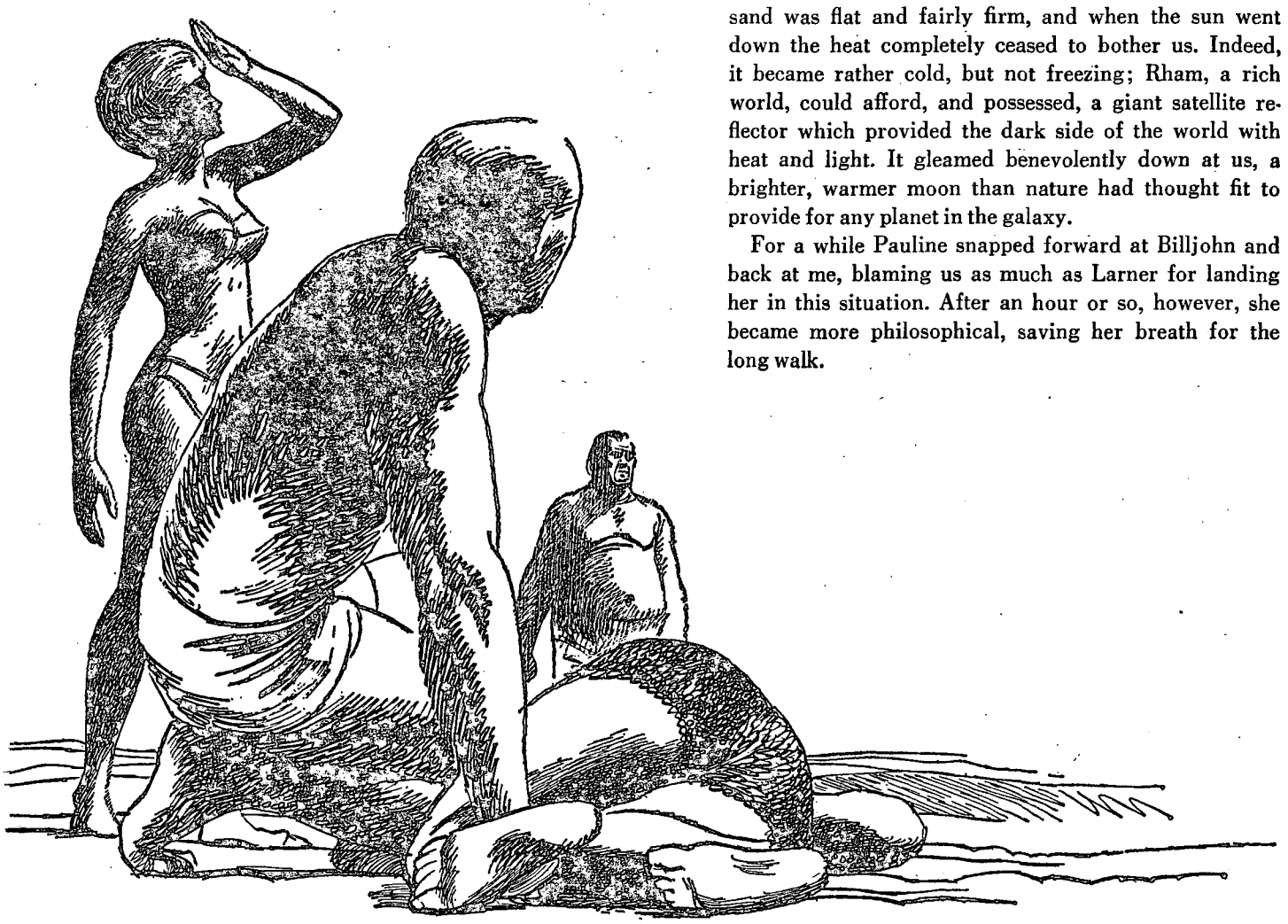
"*You* won't," Nova said coolly, "for at least a month."

"But . . . no food—"

She still didn't seem to have taken it in when we started out. Evidently she had never missed a meal in her life and could not believe that it was possible to survive for several days without food.

The sun was low and we were able to set out without waiting for the heat of the day to diminish further. We walked in single file, Nova first, then Billjohn, then Pauline, then me. We made fair progress, once the two girls had wrenched the high heels off their shoes. The sand was flat and fairly firm, and when the sun went down the heat completely ceased to bother us. Indeed, it became rather cold, but not freezing; Rham, a rich world, could afford, and possessed, a giant satellite reflector which provided the dark side of the world with heat and light. It gleamed benevolently down at us, a brighter, warmer moon than nature had thought fit to provide for any planet in the galaxy.

For a while Pauline snapped forward at Billjohn and back at me, blaming us as much as Larner for landing her in this situation. After an hour or so, however, she became more philosophical, saving her breath for the long walk.



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I won't describe the trek in detail. It was uneventful—not easy, not pleasant, but uneventful. There were no animals, no birds, no reptiles, no insects. Food was no problem—we hadn't any. Thirst was with us all the time. We decided we were going to reach Rham City on the morning of the fourth day—the last day of the warship's state visit—and grimly forced ourselves to drink no more than a quarter of the contents of our bottles each day. Having one bottle each, we knew this was a matter for each of us individually. There were no reserves.

We slept through the heat of the day, throwing up a wall of sand for shelter from the blazing sun. Throughout the evening, night and early morning—twelve standard hours—we plodded in a dead straight line across the desert, making all of two miles an hour on average, cutting rests to a minimum.

Alone I might have traveled faster, but not so much faster that it was worth while going ahead. Nova would not have held me up much. Even Billjohn, fat and heavy and old as he was, was no great drag on us. It was Pauline who held us back, and we soon wished quite as much as she did that she had not been caught up in this purely Coran-Marlock affair.

Although she was good-natured, she was as lazy as most Rhamians, and only the threat of leaving her behind forced her to try to travel as fast as we wanted to. On the evening of the second day, when we started again, she said she'd stay where she was and we could send a helicar to pick her up when we got back. We shrugged and left her. But two hours later she caught up with us, breathless and frightened. Left alone she had realized that in eleven thousand square miles of desert finding her wouldn't be easy.

We saw one plane. We had nothing to burn and could not attract the pilot's attention, so we had to watch it go.

The third night we were crazy with hunger, of course, but we had known all along we would be. When dawn came we kept going as long as we could, and at last Pauline dropped back to talk to me.

"Why doesn't Nova stop?" she said. "Isn't she ever going to stop? Is there any chance of reaching Rham City now if we keep on?"

"None, I should think," I said. "But tomorrow we just have to keep going. Our water will be gone."

"Well, that's tomorrow, isn't it? Why do we have to keep on now?"

"There's no way of shortening the distance we have to travel. The further we go today, the less is left for tomorrow."

After a sulky pause she said: "You don't think much of me, do you?"

I grinned slightly. "You do seem to find it hard to accept the obvious, Pauline."

"I didn't ask to be marooned in the middle of the desert."

"Neither did we."

"But you're Marlock spies, aren't you? It's on the cards that things like this can happen to you."

"Sure."

"Well, that's your job. It isn't mine. I was minding my business . . . you can't expect me to take it as calmly as you."

"I don't."

She stumbled and I reached out and grabbed her. I was going to call to Nova, but when I looked up I saw she was stopping. The sun was now quite high and we couldn't keep going much longer.

Billjohn joined Nova about two hundred yards ahead and they started throwing up the usual sand shelter. Pauline bent and began to do the same, right there where we were.

I didn't say anything. The two previous days we'd all slept together. But if Pauline wanted it this way, it was nothing to me. I just wanted to sleep. Within two or three minutes I was doing it.

I woke up with the usual horrible taste in my mouth, the usual blazing hunger, the usual thirst. The sun was low in the west—in an hour or so we'd be on our way again.

The last hop. It had to be. I took a mouthful of water and had to force myself to tear the bottle away from my lips.

When I looked up, Pauline was watching me. Without preamble she said: "If you want to make a pass at me, I'm waiting."

"I couldn't make a pass at anything right now except a bowl of soup."

She sat back on her heels. "Couldn't you? I thought you were tough."

"I used to be. I'm nothing but an empty shell any more."

She put her arms behind her, reaching for the clasp of her brassiére, watching me archly.

I could have hit her. All my irritation with her rushed to the surface. This ludicrous episode was typical of Rham and Rhamians, I thought. They were careless and lazy and sensual and they cared for nothing but pleasure. They didn't know what life was, these plump, spoiled children.

Then I really looked at her. She had lost all her surplus weight and was lean and firm. Even after three days without food, I suddenly found that the situation wasn't quite so ludicrous after all.

We reached the edge of the desert just after dawn. As soon as we saw Rham City we saw the *Mars*, towering over the flat-topped white buildings, as huge and solid as ever.

"Thank God," Billjohn murmured. "We're not too late, anyway."

We stumbled into the first beach reservation we saw. At this time in the morning it was quite empty, its striped unbrellas and deck chairs and plastic-topped ta-

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bles looking naked without hordes of tanned, laughing Rhamians to clothe them.

An hour later Billjohn and I were at the Embassy, feeling fully half human. Indeed, after four days of losing weight Billjohn looked more human than usual.

He was beaming. "There's no better time to strike," he said happily, "than when the enemy expects you to do so, but just before he's ready for you. My men didn't get Larner, but they picked up two of his top agents and a girl, stunned them and dumped them in a helicar, and they're now on their way to the Black Rock hills."

"Not little Sahara?"

"If they were dumped in the desert, Larner would know where to look. Fifty miles inside the Black Rock hills works out about the same—"

"And you're pleased with yourself, boss?" I said meekly.

"Well, it's all we can do. Complaining to the police is no use, we know that. Even Pauline recognizes it—"

"Yes, Pauline. Know why you were able to pick up three top Coran agents so easily, boss? Because Nova and I kept Pauline quiet for you. We didn't let her phone Larner."

Billjohn gaped, but only for a moment. "So Larner planted her with us," he said. "How did you find out?"

"When she insisted on making love to me to prove she was a Rhamian. It was a mistake. It worked the other way. I know how the local girls make love. She doesn't, not in detail. She was planted for several reasons, I guess, the second of which was to warn Larner the moment we got back. I fixed that by not leaving her alone while you were phoning the Embassy. Nova and I stuck with her the whole time—"

"So you told Nova?"

"I've also asked her to fix a tracer bug on Pauline at the hotel. That shouldn't be difficult, since we're all pals together."

"You didn't think of consulting me about all this?"

I lit a cigarette, only my second in four days. It tasted wonderful. "It's hard for three people to hold consultations without letting the fourth know anything's going on. When I got Nova to massage my ankle last night, I don't think Pauline was suspicious. But if I'd made an opportunity to talk to you too—"

Billjohn nodded. I was forgiven.

"We decided," I went on, "that if you went ahead and quietly put three of Larner's agents out of the way, as you planned to do anyway, nothing could suit us better."

"I'm so glad."

"Listen, this is the situation: Larner dumped us in the desert hoping we wouldn't get back until the *Mars* had left. He planted Pauline with us with several purposes in mind, the first being to delay us and make sure we didn't get back until the *Mars* was gone. That didn't work because we just didn't let her delay us. The second was to warn him when we got back. That didn't work either because without letting her know she'd given herself away, Nova and I stuck with her so that she couldn't phone anybody without making such a point of being alone while she did it that we'd become suspicious. With me so far?"

"No great demands have been made on my intellect as yet."

"Right. Now since Thorsen reports nothing out of the ordinary, Larner's big effort must still be to come—before the *Mars* takes off at midnight tonight, in fact. By hitting back sooner than Larner expected, you've put three of his top agents out of action. Who was the girl anyway, Mary Hollins?"

"Naturally. If I couldn't get Larner himself, I wasn't going to settle for anything less than the next three on his payroll."

"Good. Well, my idea may not work, but then again, it might. Nova goes back to the Astoria and plants a tracer on Pauline. Then she goes to bed and sleeps. What happens?"

"Pauline calls Larner and reports to him."

"Right. And what are the chances that Larner will tell her: Look, honey, I know you've been in the desert for four days, but that fat Billjohn has snatched my three top agents. For the big show tonight I'm going to need you."

Billjohn stared at me with gratifying amazement on his face. "It must be contact with Nova Webb that's done it," he muttered. "You never showed enough sense to come in out of the rain before."

I grinned. I saw no reason why I should tell him that Nova herself had worked most of this out when I told her out on the desert what I had discovered about Pauline.

I slept for a few hours in the middle of the day, knowing that Pauline was doing the same thing.

Nova had done better than plant a tracer bug on Pauline. She left a miniature transmitter in her room instead. She was thus able to hear half of Pauline's phone conversation with Larner. It went something like this:

"Harry? We got back an hour ago, but there were people around. I wasn't able to call you without . . .

"Well, that's too bad, Harry, but you can hardly blame me. If I'd insisted on making a private phone call, they might have wondered . . .

"Hell, do I have to? Don't I get a rest?

"Well, that's not so bad. Tonight at seven-thirty, then. I'll be there."

That was all—more could hardly be expected on an open line.

Pauline was to be somewhere that evening at 7:30. My—or Nova's—plan was working so far: stripped of three of his agents, Larner was calling on Pauline to assist him in his scheme, almost certainly aimed at the *Mars*.

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Larner would know he himself was watched. Unless he could be certain he had lost all Billjohn's minions, he personally would not be involved. He would be at the Coranian Embassy.

No doubt he was reluctant to use Pauline, since she was known to us. But he could hardly have any agents who were not. He preferred using Pauline, whom we knew but not as an agent of his. Maybe he had no choice.

At seven o'clock I tapped on the door of Nova's room. After a slight delay she appeared in a flowered silk wrap, not looking at all like a girl who had spent the last four nights in the desert.

She motioned me inside. "Wait here," she said.

Surprised, I said: "Where are you going?"

"Along to Pauline's room. With luck I may be able to plant your tracer for you."

She had it in her hand—a tiny metal object actually designed to look like an insect.

"Why now? Why didn't you plant it when you planted the transmitter?"

She looked at me pityingly. "You imagine, perhaps, that a girl who stays in this hotel possesses only one pair of shoes? One coat? One dress?"

She slipped out, leaving me crushed. It was true that there wasn't much point in planting a tracer on a garment that was going to be left in a drawer.

Nova was back in five minutes. She still had the tracer in her hand.

"Sorry," she said. 'Pauline told me she had a date and had to get dressed. She didn't encourage me to stay. You'll have to pick her up outside."

"But she'll change her face—"

"Of course. I can give you one hint. I saw the makeup she was going to put on. If she understands colors, and I think she does, her dress will be purple."

"Purple. O.K. What are you going to do?"

"Me?" She was surprised. "Nothing. I tell you what to do. You do it. Wait . . . one thing. If you expect a raid on the *Mars*, hydrogen bombs, substitution of officers—forget it. Larner's plan, if he has one that has any chance of working, will be simple and will employ some loophole that's been missed. Oh, by the way, Pauline plays rough."

I waited inquiringly.

"She tried to give me a doped drink just now. I guess she thinks I drank it."

"What did you do with it?"

"Poured it on the sofa behind a cushion. She's in a hurry. With luck she'll miss it and think I'm out for the next twelve hours at least."

"Well, you're not going to do anything anyway, are you?"

She smiled coolly. "I don't know—I expect you'll have to phone me up and ask me what to do."

I went downstairs and stationed myself at the main entrance where I could watch everybody who came out.

Disguise in these days of fleshwax and muscle-contracting salves can be so effective that you could pass your own brother in the street, stare at him and fail to recognize him. False beards and dark glasses are out. Contract your cheek muscles, lengthen your chin, change the shape of your nose and put a rinse through your hair, and you're somebody else—so long as you remember to change your walk, too.

Pauline was sure to change her appearance. I hoped Nova was right about the purple dress. I needed a break like that.

Women, fortunately for us male agents, are handicapped, especially on a warm world like Rham. Dressed or undressed, they have to show so much of their real shape that a lot of elimination is possible. Except in extreme cases, you can't positively identify a girl by her figure. But you can be sure a one-hundred-pound girl isn't the one-hundred-forty-pound woman you're looking for.

At 7:20 a woman in a purple dress came out alone. The time was right, the color was right and the dimensions were approximately right, yet I hesitated. Could Pauline be so convincingly matronly? Four days ago perhaps, but now?

For agonizing seconds I stood irresolute, unable to decide whether to follow this woman and perhaps lose Pauline, or let her go and then make up my mind, too late, that she must have been Pauline.

Then a girl in a lilac dress came out.

It still wasn't possible to be certain. This girl looked slimmer than even the new Pauline, and younger. She also looked more like a Marlockian than a Rhamian or Coranian. Still, that might be a clue in itself.

I followed her, anyway.

The bug tracer would have been useless, as it turned out, unless it had been slipped in her handbag. She wore no wrap or cape and her shoes, such as they were, were white. The bug Nova had had would have been noticed and brushed off, wherever we put it, by the girl herself or somebody else. And, if Pauline found it, she'd know we'd spotted her as one of Larner's agents.

At 7:30 the girl I was following stepped into a public phone booth. I didn't approach closely; you can't hear what's being said inside no matter how close you are.

Then I saw nothing was being said inside. She took a paper from behind the box, read it carefully, and then burned it. She came out without making a call.

I was satisfied. This must be Pauline, and she had been reading her instructions.

Further proof was forthcoming when she went to the Via Naroonia Argosy and sat at an outside table until it got dark, and then went inside. We had already discovered that the Argosy had some tie-up with Coran. If Larner's men wanted to pump anyone, they took him to the Argosy. No questions were asked there.

An hour passed and nothing at all happened. Pauline sat alone at her table and stayed alone. Three times she

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was approached. She must have said something monumentally rude, for the three men left her with thunderous expressions.

Me, I found myself a seat right at the back of the club and pretended to be a gargoyle.

Not many hours ago Pauline had been claiming a thirst which would last her the rest of her life. It hadn't lasted very long—she sat for an hour with the same drink in front of her, untouched.

At about nine o'clock half a dozen Marlock navy men in green uniforms came into the club, and I began to see a glimmer of light.

Only a glimmer, however. Even after Pauline had carved herself out a fair-haired young ensign and taken him to her table, the glimmer didn't brighten.

From the way they talked to each other it was easy to guess that she was pretending to be a Marlockian girl, and using this as an excuse for picking up the young officer so blatantly—a familiar face on a strange world. But what she hoped to accomplish was as great a mystery as ever.

I ran through possibility after possibility, only to discard them all, one after another. The idea that she was pumping the ensign for information was ludicrous: he couldn't possibly have any. It was equally out of the question that she was trying to persuade him to co-operate in some scheme of sabotage or betrayal. The chances of succeeding with an officer picked at random were negligible. If there was any idea of whisking the ensign out of sight and substituting a Coranian agent, the attempt would be a dismal failure—navy men returning to the ship were checked in a dozen ways as a matter of routine.

In an effort to think of any possibility that made sense I cast my mental net wider and wider. I had plenty of time. Pauline was plying the ensign with drink, and drinking along with him. I now saw why she had sat for over an hour with an untouched drink in front of her. She had been trying to work up a thirst.

Navy men from ancient times have been traditionally suspicious of anyone who makes them drink and does not drink along with them. On the other hand, nobody is less suspicious than a friend who does drink along with them. And Pauline, no doubt assisted by her four days in the desert, had a thirst that enabled her to keep up with the ensign.

It would be pointless, too, I reflected, sipping my fifth beer, to make the ensign incapable of joining his ship before she left. For the *Mars* would certainly not wait for an insignificant junior officer. She would take off on schedule and the ensign would be posted AWOL.

Besides, there were now ten or eleven other Marlock navy men in the Argosy, staying clear of Pauline and her companion but taking due, slightly envious, note of every smile and gesture. Nothing could be less secret.

I looked at my watch. It was after eleven, and the *Mars* took off at midnight. The ensign's pass could not be for later than 11:30. And I still hadn't the faintest idea what was going on.

I left my beer and slipped out of the club as unobtrusively as possible. I could have phoned from the club itself, but I had not forgotten that Larner was in cahoots with the management. Phone calls from the club might well be monitored by Coranian agents or sympathizers, especially when something was going on inside at the time.

Nova sounded smugly satisfied when she answered, but I ignored that. I told her in detail what was happening and asked her if it meant anything to her.

"I take it the precautions you mention are really carried out on the *Mars?*" she said. "Conscientiously?"

"Certainly. Thorson is unimaginative but thorough."

"Tell me, have you ever heard of bacchanite?"

"Bacchanite? What's that?"

"I take it you haven't. That's what Larner was counting on. It really is as well for Marlock that I'm around—"

"Well, what is it?" I demanded.

"I won't tell you over the phone. The best thing for you to do is go straight to the *Mars* and see Captain Thorson. Make sure that when that ensign returns, he isn't allowed on board the *Mars.*"

"Huh?"

"He's to be left behind this trip. Fix that, and I'll attend to the rest."

"I don't know the ensign's name—"

"You can describe him, can't you?"

So I went to the *Mars* and with some difficulty managed to see Thorson. He wouldn't let me on board the ship; he came down to see me. He was not pleased.

"Leave Barlow behind?" he exclaimed, when we had managed to establish the ensign's identity. "Nonsense. You Intelligence people are all the same. See a man drinking with a suspicious character and you assume he's a spy—"

"Leave Barlow behind, captain," I said quietly. "If you're not satisfied that I have authority to request this, lets you and me call the Marlock Embassy."

"But it's nonsense. Sure, Barlow will be no damn good for anything when he comes back. He'll be tipped in his bunk and tomorrow—"

"Captain, are you going to leave Barlow behind?"

"No," he said firmly.

"You're relieved of your command, captain. Your executive officer will take over. Confirmation will come through from the Embassy in a few minutes."

Although it was a bluff, it stopped Thorson and forced him to think. Probably he had some excuse for his contempt for the pettifogging restrictions of Intelligence and Security. The trouble with Security is that you have to make a thousand apparently unnecessary checks to make sure of including the one necessary one.

"Wait, you, what's your name—Smith. Can you give

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me any sound reason for leaving Ensign Barlow behind?"

"Two," I said. "One is that if you take him with you, you'll be lucky if you're an ensign yourself when you get back to Marlock. The other is that you probably won't get back to Marlock at all."

Ten minutes later, when Barlow returned, he was placed under close arrest. Two navy men were left behind to take him to the Marlock Embassy.

Nova picked me up at the spaceport just fifteen minutes before the *Mars* was due to take off. She had hired a helicar and was flying it herself.

"Get in," she said. "Barlow's been sent to the Embassy? Good. I've already called them and told them what to do with him. The *Mars* can take off as planned."

I got in. "Nova," I said, "what is bacchanite?"

She wasn't listening. She was sending the helicar skimming along the Via Naroonia only twenty feet above the ground traffic.

"This is illegal," I protested.

"I know. It doesn't matter. We're landing. Look." She pointed ahead and down.

We dropped close beside Pauline, who was walking back to the hotel slowly and carefully, carrying a heavy load.

"Hi, Pauline," Nova said. "We'll give you a lift."

Pauline looked at us rather dazedly. But she came over and climbed into the helicar.

Nova had a flask with her. "I've got just what you need," she said.

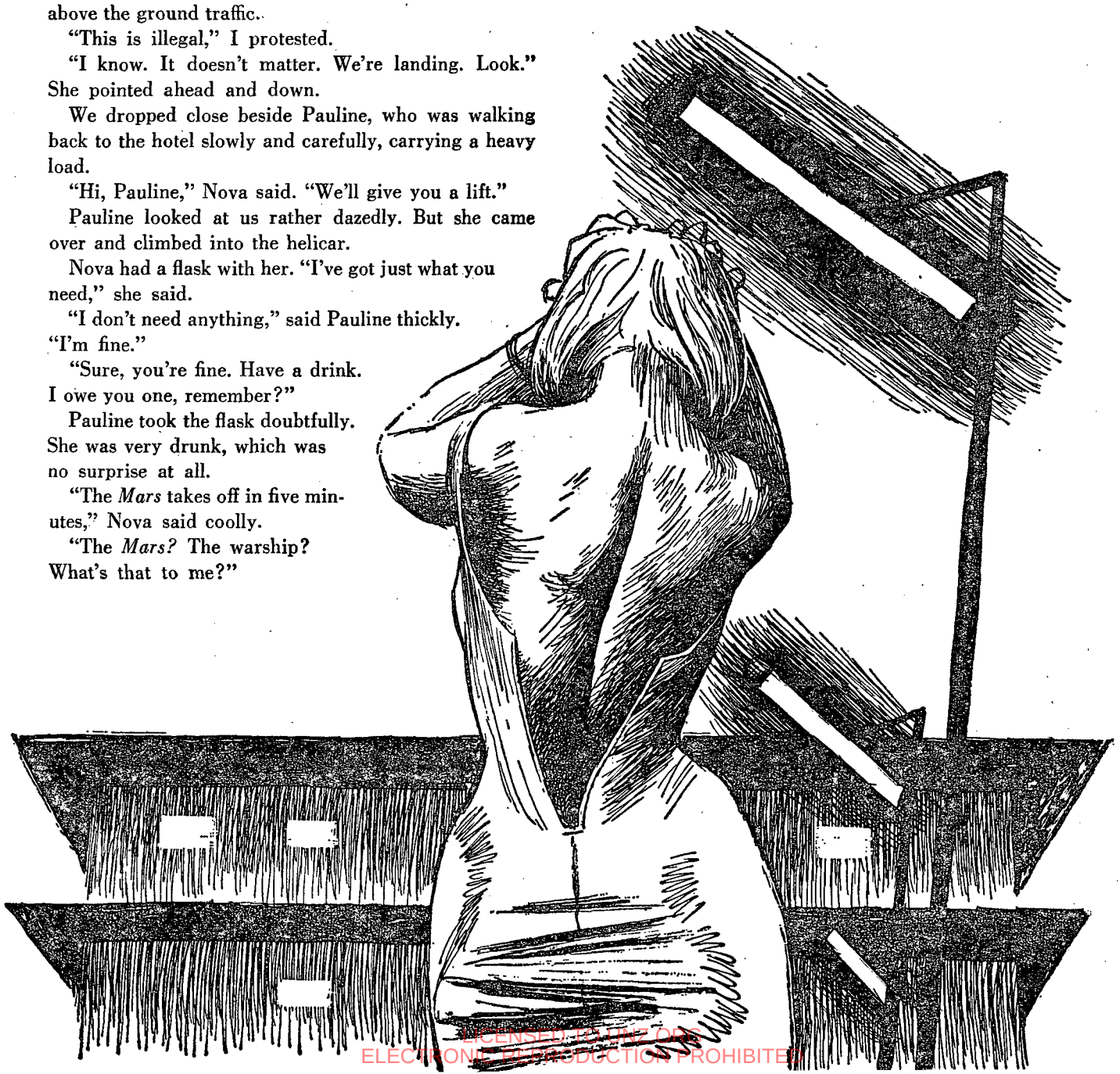
"I don't need anything," said Pauline thickly. "I'm fine."

"Sure, you're fine. Have a drink. I owe you one, remember?"

Pauline took the flask doubtfully. She was very drunk, which was no surprise at all.

"The *Mars* takes off in five minutes," Nova said coolly.

"The *Mars?* The warship? What's that to me?"



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"Is there some reason why you shouldn't have another drink, Pauline?" Nova said thoughtfully.

"No, except that I've had enough."

"Have you? I think you should have another. The *Mars* takes off in four and a half minutes, Pauline."

Pauline shrugged and put the flask to her lips. She took a sip and then hesitated. It was only too clear that if there was any time in her life when she particularly wished to be sober and completely clear-headed, it was now.

"Shall we go and watch the ship take off?" Nova said.

"If you like. What's it to me?" Trying to be nonchalant, she drank some more. Then she stared. The car was landing outside the Coranian Embassy.

"Want to go inside, Pauline?" Nova said. "Want to report to your boss Larner?"

"I don't know what you're talking about," Pauline said uneasily. "I'm a Rhamian. I know nothing about—"

"Yes, you do, Pauline. Don't you want to report to Larner? Or do you want to stay with us? We're working for Marlock, you know. And the *Mars* takes off in three minutes."

Suddenly Pauline jumped out of the helicar and ran into the Embassy.

"What was all that in aid of?" I demanded.

Nova ran the car across to the other side of the street and parked there. "Got a cigarette?" she asked.

We waited. I gave up trying to make Nova say anything. It was useless.

We saw the *Mars* climb on an orange pillar of fire into the night sky. In a matter of seconds there was nothing more to see.

Nova condescended to unbend slightly. "Pauline cooperated," she pointed out, "because she believed Barlow was on the ship. Nothing mattered except stalling for a few moments until it was too late to haul him off. And she didn't think I really *knew* anything."

"So?" I asked.

"Wait."

We waited for ten minutes, twenty. Then suddenly there was an explosion within the Coranian Embassy. Glass shattered and we heard screams. Part of the roof had caved in, and fumes poured from the aperture. Dust began to settle.

As explosions went it was not impressive. Imagining such an explosion occurring within the *Mars* instead of in the Coranian Embassy, however, I started convulsively and stared up at the sky.

"It's all right," Nova said coolly, starting the motor. "Barlow isn't on board, you see."

I wasn't sorry Nova was gone.

She knew the spy business, that girl. I guess we were as ignorant and unsubtle as she said. Occasionally she might make mistakes—who doesn't?—but on a long-term business I guess she'd be twice as efficient as Billjohn and me put together. And if she was an iceberg, and she was, that only meant that she did her job unhampered by human frailty.

All the same, that last performance of hers gave me the shivers.

Pauline was working for Coran, true. I guess it was softheartedness on my part to think that what happened out on the desert made any difference. Certainly it made none to Nova.

Bacchanite tastes like alcohol and has the same initial effect as alcohol. Funny, once you know about bacchanite you can see that it was only a matter of time before somebody developed something like it. We humans have a taste for effective nastiness.

The real difference is, bacchanite is not nearly as stable as ordinary alcohol. When the digestive juices start working on it, it becomes something quite fierce, and any unfortunate person who has drunk a lot of it believes he's going to die. But he doesn't die—if he lies quietly and puts up with it for about six hours, the body eventually conquers the bacchanite.

On the other hand, if he takes a violent emetic, the resulting chaos inside him results in a nasty little explosion.

It was predictable that if Barlow, on the *Mars*, developed the symptoms which bacchanite produces, the medical officer would have given him an emetic.

Afterwards, it was possible to understand how Pauline had felt herself forced to act as she did when we picked her up. She believed that Barlow was on the point of leaving on the *Mars*. It was only a matter of making sure the *Mars* left with him on board.

I saw the purpose of Nova's reminders that the warship would leave in five minutes, four minutes, three minutes. Pauline must have decided she guessed something, but wasn't quite sure. Nova might have the wrong idea altogether, and if she had the right one, Pauline didn't want her to become sure.

So she drank from Nova's bottle.

The stuff tasted all right—but there was a violent emetic in it.

Larner, we found later, was killed in the explosion. To say Pauline was killed, too, was a truism—she *was* the explosion.

We waited for reprisals, but they didn't come. Evidently the Coranians figured the mistake was their own and that we could not possibly be responsible for what happened.

Barlow had a bad day and then recovered.

"A remarkable girl," Billjohn said, just after Nova had left for Earth. I think Billjohn, too, was glad she was gone. He's a quiet, peaceable soul really.

"Girl?" I said. "She's no girl, she's an electronic brain set in an iceberg. I'd rather have a date with Pauline, any day."

"You're too late for that," Billjohn remarked. "But would you care for a glass of bacchanite?"

I shuddered. ■

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A SLIGHT CASE OF LIMBO

For arthritis they say the best thing is to lie down and be patient. Most victims, however, aren't enabled to do that—

by LLOYD BIGGLE, JR.

ILLUSTRATED BY LEO SUMMERS

The wind's shrill moaning sank suddenly to a muted whisper, and above the clatter of rain on the corrugated roof George Cramer thought he heard a scream. He opened the door and peered doubtfully into the rain-lashed night.

At his feet the swollen river swished and gurgled around the pilings. The rowboat, swinging with the current, struck the side of the dock with loud, irregular thuds. Cramer aimed a flashlight at the distant shore, but the blackness casually swallowed up the beam. He could see nothing.

Suddenly the cry came again, a long, sobbing scream that hung convulsively over the river until a fresh surge of wind twisted it into silence. Cramer did not hesitate. He grabbed his oars and leaped into the boat, and seconds later he was headed out into the current, rowing frantically.

He shouted over his shoulder, but if there was an answering cry the wind wrenched it away from him. The chill, driving rain instantly drenched his head and clothing and left him suddenly cold even as he panted and perspired at the oars. His erratic old heart filled his chest with its relentless pounding; his swollen arthritc hands brought gasps of pain to his clenched lips as he worked the oars. He shouted again as he turned the boat into the rampaging current, and paused to flash his light. An answering call came from far down the river. Cramer bent his exhausted body to the oars, and sent the boat rocking forward.

Long before he neared that struggling, helplessly-bobbing figure in the water Cramer knew that he was dying, and that knowledge brought a half-smile to his taut face. It would be a good trade, he thought—his own feebleness and disease, his aged, worn-out life, for a young, healthy life with direction, and purpose and meaning. Instead of a wretched end in the sordid loneliness of his cramped cabin, this unexpected twitch of destiny offered an embattled death that he could welcome and embrace fully. His sobs of pain were fervent hosannas as he drove the boat forward, punishing himself, struggling to focus his last flickers of life into one memorable conflagration.

And he reached his objective. A hand clutched the side of the boat. Cramer turned to assist, and at that instant his heart exploded.

He opened his eyes to the bare rafters of his cabin. An elongated patch of sunlight lay against the far wall. Beyond his window birds sang, and a light breeze caressed the trees overhead. He tried to move his arms, to sit up.

A voice came from far off, deep, softly soothing, pleasingly musical. "Easy! Easy! You need rest. Sleep . . . sleep . . . sleep."

Cramer slept.

When he awoke a man was bending over him. Cramer watched the round, placid face for a moment before he became aware of the dexterous fingers that applied a bandage to his chest.

"You're a doctor?" Cramer whispered.

"No," the voice sang. "No. I am not a doctor."

"A nurse, then." The idea seemed incongruous with this monstrous hulk of a man, but the fingers were infinitely gentle. "I was dying," Cramer said. "I died, and you . . . was it you—"

"Quiet!" the voice sang. "It was you, friend Cramer, who saved my life. And you need sleep . . . sleep . . ."

The next time Cramer awoke he was alone. He edged himself cautiously into a sitting positon. The room was just as he'd left it when he dashed out into the storm, and that was—at least a couple of days ago, he thought, fingering his beard. But he felt fine. He felt wonderful until he moved his legs and his arthritis reminded him painfully that he hadn't been taking his medicine.

He hobbled over to the medicine cabinet for his pills, and then he decided to dress. His bandaged-swathed chest puzzled him. The strips of pink cloth were soft as the softest gauze, yet they resisted his tugging. He left them in place, and pulled on his clothes. He eased himself into the chair outside his door, and leaned back to enjoy the bright sunshine.

"So you are up, friend Cramer!" the voice sang. "It is well. It is proper."

Cramer's nurse approached along a forest path, tremendous in height and bulk, walking with a rolling gait that made Cramer want to ask if he'd been a sailor. He stood looking down at Cramer, round face expressionless, eyes darkly solemn, a small tuft of hair ridiculously isolated on the top of his head.

But his voice was warmly musical. "How are you this morning, friend Cramer?"

"Oh, I feel fine. Just a little weak, yet. Thank you. May I ask who you are?"

"Who . . . you mean you would like my name. That is proper." He seemed to ponder the question. "Perhaps you would prefer to call me Joe?"

"Certainly, Joe," Cramer said.

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"And now you are well. Now we shall remove the bandage."

The long fingers quickly opened Cramer's shirt, and expertly unwound the encircling strips of cloth. The fingers paused as the bandage fell away. Joe's round face assumed a blank expression that Cramer could not interpret.

"You have not healed as quickly as I expected," he announced.

Cramer stared at the open incision above his heart. "You had to operate?"

"Yes, operate. You would call it that."

"Oh! You massaged my heart to get it going again."

"No," Joe said. "Your heart would not go again. It was a very bad heart."

"I don't understand," Cramer faltered.

"I'll show you. But first, the bandage."

Joe quickly bound the bandage into place, and rocked away into the woods. Twenty minutes passed, a half hour, and he came rocking back. He held a transparent, flasklike object up to the light. "You see?" his voice sang. "A very bad heart."

Cramer stared incredulously. The flask did, unquestionably, contain a human heart.

"Very bad," Joe said again.

"You mean . . . my heart—"

"Yours. Certainly."

Cramer started to laugh. This Joe, he thought, was all the character he looked to be. "What's keeping me alive?" he asked, wiping his eyes. He pressed his hand to his chest, felt for his wrist, and stopped laughing. He had no heart beat, no pulse.

Joe said seriously, "But I gave you another."

"You said you weren't a doctor," Cramer said.

"But the heart is no problem for a doctor! It is more . . . I think you would call it an engineering problem."

"I suppose," Cramer said. "It's just a pump."

"That is correct. So I have given you another pump."

"A better one, I hope," Cramer said, feeling again for his pulse. He could not find it.

"Much better. This one does not wear out."

"All right. Whatever you did, I thank you. If this is a gag, as it has to be, I still thank you. Out there on the water I didn't much care if I lived or not, but sitting here with the sun shining I'd just as soon stick around for a while. So I thank you."

"And I, friend Cramer, thank you. There is a bond between us, because we have saved each other's lives. But I think my debt greater than yours. I'll come again this evening."

He rocked away, carrying the flask.

Cramer's strength returned slowly. He knew that exercise would have helped him, but his arthritis seemed worse each day, and the few hobbling steps he took about his cabin were searing torment.

Joe appeared punctually in the fading light of evening, songfully inquired as to his health, and soberly examined his chest, where the incision was healing in a neat scar line.

"I'll have to get into town," Cramer told him one evening.

"But why not?" Joe sang. "You are almost well."

Cramer lifted a swollen foot. "I can hardly walk. If I don't get some medicine quickly, I won't be able to walk at all."

"Myself, I do not go onto this town. But if I can help—"

"If you can get me as far as the Morton's farm, Ed or Ruth will take me into town."

"Do you wish to go now?"

"Tomorrow," Cramer said. "Tomorrow afternoon. The doctor isn't in his office in the morning."

"Tomorrow," Joe agreed.

He carried Cramer in his arms, as easily as he might have carried a child, and deposited him on the Mortons' front porch. Before Cramer had finished knocking he had disappeared. Ruth Morton drove Cramer to town, and helped him hobble up the steps to the doctor's office.

Old Doc Franklin, who was some ten years younger than Cramer, looked at the swollen feet and ankles and scowled. "I thought we had this controlled."

"So did I," Cramer said.

"But you insist on living out there in that damp hole."

"I ran out of pills," Cramer said.

"Let's see your hands. Is it bothering anywhere else?"

"My knees. My wrists, a little, and—"

"Elbows and shoulders," Dr. Franklin said. "In short, in just about every joint in your body. Going without your pills for a few days wouldn't make it spread that quickly. Let's see those knees."

He took one look, and tilted back to stare morosely at the ceiling. "I'll give you something different," he said. "We'll see what happens. I'd just as soon leave the shots as a last resort, but the way this thing is progressing that last resort isn't very far off. Now—will you move into town where someone can look after you?"

Cramer shook his head. "Not now. Later—"

"If you wait much longer, you'll be totally disabled, and you'll have a choice between being moved or starving to death. If you don't starve first, before anyone notices. For a supposedly intelligent man, and a retired college professor, you are the most pig-headed—"

Cramer listened with a grin. He'd heard this little sermon before—he heard it, in fact, every time he saw Doc.

"Stop smirking," the doctor said. "So you love fussing around the water. How much fussing will you do when you can't get out of bed?"

"I can still look at it."

The doctor snorted.

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On an impulse, Cramer said, "How about checking my heart?"

The doctor turned quickly. "Heart acting up, too? Darned if you aren't just a walking corpse."

He reached for his stethoscope.

"Never mind," Cramer said hastily, pushing himself to his feet. "There's nothing wrong with my heart."

"There's plenty wrong with your heart. Unbutton your shirt."

"No. I never felt better in my life—except for this." Cramer waved a swollen hand.

"Eighty per cent of the coronary victims say the same thing, just before they keel over. Unbutton your shirt."

Cramer picked up the prescription form, and took two painful steps towards the door. "I'll give these pills a try."

"You," Dr. Franklin said, "are stubborner than any jackass I've ever met, and I've met a lot of them. Talk about spoiled children! Sadie Brian is bringing that brat of hers in this afternoon for a polio shot, and after seeing you I can look forward to it. You don't need pills, you need a good kick in the pants, and I have half a notion—"

Cramer closed the office door behind him and leaned against it, breathing heavily, shaken by the narrowness of his escape. A few more seconds in Doc's chair, and he'd have found himself attempting to explain a scar on his chest that assuredly had not been there the last time Doc examined him—and a heart that did not beat.

"Ready to go?" Ruth Morton asked.

"I certainly am," Cramer said.

Ruth left him on a bench in the sunshine while she got his prescription filled and did his shopping for him. They drove back to the Morton farm, and Ed took charge of getting Cramer and his supplies down to his cabin.

It was evening, by then. Dusk pointed long-fingered shadows out across the water. Cramer sat tilted back in his chair by the dock, waiting for Joe.

He came swinging out of the forest, his large face white, almost luminous in the growing darkness, his voice songful as always.

"So you have returned, friend Cramer. I was concerned for you."

Cramer nodded, wondering how to say what he had to say. He pointed at the sky, where one star winked timidly through the overcast. "You come from there, don't you?"

Joe hesitated. "Not there," he said finally, and pointed at the horizon. "That way. How did you know?"

"Lots of things. Your giving me a new heart. The fact that you have too many fingers, which I noticed several days ago, but didn't want to believe. And then—"

Joe held up a seven-fingered hand. "I would have said that you have too few fingers!"

"Why are you here?"

"To study, to collect specimens—"

"To prepare for an invasion?"

"Friend Cramer! Why would my people want your distant world? There are so many closer worlds, unoccupied worlds. No, I come only to study and to collect, and when I leave it may be that none of my people will ever come here again."

"I see. When you fixed my heart, did you do anything else?"

"But I did not fix it! It could not be fixed. I had to give you a new one, and other than that I added only a few things to your blood so the new pump could operate. Your blood was much too susceptible to what you call clotting. Now that will not happen."

"But if my blood won't clot, one small cut—"

"It will clot when that is necessary. It will do it better than before. But in the veins and arteries, and in the pump, it will not clot. Do you understand?"

"I hope so. You know so much, and yet you say you aren't a doctor."

"I am not a doctor! The blood—that is merely chemistry. Engineering and chemistry I understand. But not medicine."

"It must be those things you added to my blood that have made my arthritis worse."

"What is this arthritis?" Joe asked.

Cramer explained, exhibiting his swollen hands. "Maybe the new medicine will help," he said.

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Joe was preparing for his departure. He had been on this world for a long time, he told Cramer. For many years, the way Cramer measured time. His studies were completed, and his collecting, also, except for some suitable specimens of larger animals. He asked Cramer's help, and Cramer talked with Ed Morton and gave him a wild tale about starting a new business. He began buying cattle, horses, sheep, hogs, goats, even a few stray dogs and cats. Joe furnished whatever money was needed. Cramer wondered where he'd gotten it, but thought it impolite to ask.

Joe put up a small corral for the animals, and he would take them, one or two at a time, away down the forest path. After Cramer watched the twentieth cow disappear in that direction, he remarked, "You must have a large ship."

"Not very large," the complacent Joe replied.

"Then how do you get them all into it?"

"That is only a small problem in packing," Joe said. And left with the first of an entire flock of sheep.

The new pills did not help. The arthritis became an incessant torment that intensified daily. Cramer kept to his bed, moving his pain-wracked body as little as possible. Joe looked in frequently. His placid expression never changed, but his actions, his questions, betrayed a fumbling concern.

He opened cans and prepared Cramer's meals, and as the arthritis became worse he also helped him to eat. While he worked about the corner of the cabin Cramer called his kitchen, they talked.

"This arthritis," Joe said. "Such a thing does not occur among my people. I find no mention of it in my books."

Cramer nodded dully, and concealed his disappointment. Somehow he had hoped—he had confidently expected—that Joe could do somtehing for him. A man who could casually supply a substitute heart and change the chemical makeup of one's blood should be able to handle a little thing like arthritis.

"I am sorry the things I added to your blood have done this to you," Joe said. "But I cannot help. I just do not understand it."

"Will it keep getting worse?"

"I do not know."

Cramer nodded again. "With this new pump, and the new chemicals in my blood, how long can I expect to live?"

"Who can say? Life is a fragile flame that flickers in the winds of chance. My own life would have ended in your river had you not generously saved me."

"Yes, yes," Cramer said impatiently. "But without accidents, how long will I live?"

"But without accidents, you will not die! You will not die at all. This pump does not wear out or stop."

Cramer lay staring silently at the ceiling, contemplating eternal life with eternal pain.

"Could you remove those chemicals from my blood?" he asked.

"Perhaps. It would be difficult. And soon the new pump would not work. It would—"

"Cog up?" Cramer suggested.

"Yes."

"I don't suppose you could give me back my old heart."

"But that one would not work at all!"

Cramer lifted a hand, now puffed to twice its normal size. "Soon," he said, "perhaps as soon as tomorrow, and certainly within a week, the pain will be so bad that I won't be able to move. I won't be able to do a thing for myself. Perhaps I won't even be able to sit up. I'll have to go into a nursing home, and be waited on as long as I live. I haven't enough money for that."

"This money—I can give you as much money as you wish to have."

"Even with enough money, can you imagine what kind of life that would be? Flat on my back, and in agony every time I move a finger. And it would go on, and on, and on. Very few accidents happen in nursing homes. But it seems that I have no choice."

Joe said nothing.

"Only I do have a choice," Cramer went on. "I can have you put my old heart back, so an autopsy wouldn't stir up a fuss—they could think what they liked about the incision—and end things immediately, as should have happened that night on the river. Or I can take as much money as you can give me, and go into a nursing home where I would live indefinitely but helplessly in fairly comfortable torment. It isn't much of a choice, but it is a choice."

Joe still said nothing.

"And," Cramer said, "I'll have to decide before you leave. When will that be?"

"I had thought—tomorrow. Tomorrow night. But since you have such a difficult choice to make, I could wait another day. Or two."

"If I can't decide by tomorrow," Cramer said dryly, "I won't be able to decide at all."

In the morning Joe carried him outside, and he sat cushioned by pillows and blankets and looked out at the river. Soon it would be summer, with the grating song of frogs at night, and leaping fish, and the sullen old turtle that always sunned itself on the big log a few yards upstream. He loved it all, and now, whatever he decided, it was lost to him.

But perhaps, if he entered a nursing home, medical science would eventually be able to do something for this synthetically intensified arthritis—or perhaps not. That would be a frightening gamble, because he would be doomed to endless pain if he lost. Lying helpless, closely watched in a nursing home, he would not even have the choice of taking his own life. And the first time he was examined there would be embarrassing ques-

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tions about his heart. He would be a medical freak.

Even so, sitting there looking at the sun on the rippling water, life seemed good to him—until he attempted to move.

Joe came to prepare his lunch, maintaining a sympathetic silence. He came again at dusk for the final time. A last meal, and then he would deliver Cramer to the Mortons, with enough money to last him an eternity of lifetimes; or he would replace his new heart with the worn-out one and leave his body in the cabin, to be found as chance might decide. Joe fed him—a simple meal, for a last meal—canned beans, canned hash, canned fruit, plenty of hot coffee. Cramer ate slowly, savoring each mouthful.

"Well, friend Cramer?" Joe asked, when he had finished.

"If I could use my hands," Cramer said, "I could flip a coin."

"I admire your courage, friend Cramer."

"I have no courage, Joe. Flipping a coin may be the only answer, because I haven't decided."

"If you'd like to wait another day—"

"That wouldn't help. If it were a question of *doing* something, then I could decide, I think. I had no trouble deciding that night on the river. But to sit here calmly in a chair and make a choice between living, even though in agony, and dying, is something I cannot do. So I'm going to leave the choice to you."

"To *me?*"

Cramer nodded.

For the first time Joe's round face registered a discernible emotion. He was shocked. More than that—he was staggered. "Friend Cramer . . . *I* cannot make that kind of decision for you! You have no right to ask."

"Every right," Cramer said calmly. "The whole business is your fault. If I hadn't saved your life, and then if you hadn't saved mine, there wouldn't be a problem. So it's up to you to decide. If *you* want to flip a coin, I won't mind."

Joe gazed down at him helplessly. A many-fingered gesture underscored his consternation. He attempted to speak, and sputtered inanely.

"I'm waiting," Cramer said.

"Very well." Joe's voice was no longer songful. It rasped hideously. "Very well. I shall decide for you—now."

He seized Cramer roughly, ignoring his gasps of pain, and rushed him away up the forest trail.

Professor Zukoquol, Chairman of Gwarz University's Department of Exotic Zoology, watched in fascination as a foot-long statue of a sheep rode the conveyor through the Life Rehabilitator. A full-sized sheep staggered forth at the other end, baaing lustily. A twenty-inch cow followed, to emerge as a slobbering, foul-smelling horned monster.

Professor Zukoquol's eyes gleamed with excitement. "An amazing collection!" he exclaimed. "Friend Joruloq, you have done a splendid piece of work. And you brought a full load?"

"Full to capacity," Joruloq said modestly.

"Splendid. You are to be heartily complimented. Except for your encounter with the human, of course. That disturbs me."

"It disturbs me, also," Joruloq said.

"Did he truly ask you to decide his destiny for him?"

"He truly did," Joruloq said.

"Horrifying, is it not, that a supposedly civilized creature should have no developed sense of ethics. I should not have blamed you if you had smashed him on the spot."

"But that would have been deciding for him!" Joruloq protested.

"Or gone off and left him."

"That likewise would have been deciding for him!"

"True. This is why we sternly advise our field workers to avoid contacts with intelligent beings. Their moralities are so unpredictable. All kinds of filthy dilemmas can result."

"I agree," Joruloq said. "But I had no choice, because I was indebted to him."

"I'm almost inclined to believe it would have been best if he had not saved your life. But never mind. Once you allowed yourself to become involved, I must concede that you acted with commendable wisdom. Have you made inquiries at the medical school?"

"I did so at once."

"What did they say?"

"They promise to solve the mystery of the human's arthritis at the earliest opportunity. They do not anticipate any difficulties. Unfortunately, they have many important projects that must be completed first. It will be a thousand or two of his years before they can consider his problem."

"Generous of them to place him so far up on their schedule, consideriing that the project would be of no importance whatsoever to anyone but him. What will you do with him in the meantime?"

"Nothing."

"You do not intend to rehabilitate him?"

"Certainly not," Joruloq said. From a fold in his cloak he took George Cramer—an eighteen-inch figure that stood in a half crouch with swollen hands upraised, a look of intense surprise on his face. "No, I would not force him to live in pain for a thousand or two of his years while waiting for the medical school to find time for his case. I won't rehabilitate him until they are ready for him."

"You might loan him to the museum."

"I think not," joruloq said. "I'd much prefer to keep him near me. He did save my life, you know, and I feel both gratitude and fondness for him. Also, he makes an excellent paper weight." ■

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PORTRAIT OF A PLANET

There is probably no living astronomer who has devoted so many years to the study of Mars as Dr. Earl C. Slipher of Lowell Observatory. Starting as an assistant to Percival Lowell, he made his first photographs of Mars in 1905, in the era when Lowell was certain that Mars was inhabited by civilized canal-builders. Through the years he has developed a series of techniques to turn the handicaps of photography into advantages.

Between 1903 and 1960, at Flagstaff, Arizona and at stations in the southern hemisphere, Lowell Observatory astronomers have made more than 200,000 photographs of Mars. From this vast collection, plus thousands made at other observatories, Dr. Slipher has selected some five hundred to illustrate what he calls "The Photographic Story of Mars." It is a school-atlas-sized book, published by Sky Publishing Company, Harvard Observatory, Cambridge, Massachusetts for $8.50. A seventy-page introduction is followed by fifty pages of plates with detailed, full-page explanatory captions. There are two full-page color photographs of Mars, a double-page map made by Lowell in 1905 and a larger folding map representing the present "state of the art" of mapping the Red Planet, and numerous charts and text illustrations.

Mars, incidentally, was in opposition on February 4, 1963 at a distance of about 62,200,000 miles. It will be coming closer now, reaching its closest opposition for some time in August, 1971, at only 34,900,000 miles. That's the time for a visit.

The pictures in Slipher's "Mars" *are* the book. The introductory text sums up our knowledge of the planet as the author sees it, but adds very little to the knowledge of even an informed layman. The "farthest out" of the conclusions which the author expresses in his final chapter are that water is "scarce" on Mars, and that there is vegetation there. Such recent theories as McLaughlin's volcanic hypothesis are mentioned but not discussed. Vaucoulers' "Physics of the Planet Mars" is still the best reference book on the planet.

The photographs of Mars have been reasonably well reproduced by letterpress, but one can only wonder wistfully what a top-notch American or European lithographer might have made of them. In my copy, for example, Plate XXI has a printer's blemish making a long black streak across three of the nine photographs. Fine detail was also lost—but major detail sharpened—by the process of superimposing negatives so that the grain of the emulsion more or less cancels out. Even so, the accompanying —and very excellent—commentary on each plate must have been written from the original photographs, for details that the plates are supposed to illustrate quite often have disappeared in the printed reproduction: most of the atmospheric belts in Plate XLIV, for example, and the canals that are supposed to be visible in Plate XLVII.

The book makes far clearer than others have just how difficult planetary photography is. Dr. Slipher points out that during a one-second exposure the image of the planet on the photographic plate is likely to dance around, because of turbulence in our atmosphere, with many displacements exceeding a twentieth of the disk's diameter. Since the fine-grained emulsions necessary to resolve detail also require relatively long exposures, a law of diminishing returns goes into effect. This is the reason why the "instantaneous" reaction of a light-adapted eye enables many astronomers to see details that can't be potographed.

Plate III, made near the opposition of 1911 just after Mars had emerged from behind the Moon, also gives striking evidence of the minute scale of the image with which astronomers must work—about the size of a smallish crater on the Moon.

Incidentally, Dr. Slipher is the first astronomer I can recall who points out that our own Earth has a polar cap of about the same magnitude as that at the Martian poles. Most of us tend to think of the cap as an area of perpetual snow—some would say frost—but it spreads and contracts with the seasons exactly as do our winter snows. In a hard winter, our own snow cover—Earth's north polar cap—may extend down to northern Florida for brief periods, or to Latitude 30 degrees North, and in most winters there is all-winter snow well down into northern New York, New England, Wisconsin and Minnesota or almost to Latitude 45 N. It doesn't come quite so far in Europe and may come farther in central Asia.

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The south polar cap on Mars has come down as far as Latitude 40 N; it may also disappear entirely in summer, which ours never does. The north polar cap ordinarily extends only about three-quarters as far, but never entirely melts in the shorter northern summer. This is additional evidence of the scarcity of water on Mars: if there were as much as there is on Earth, the entire planet would probably be perpetually covered.

The book, then, is in many respects a disappointment. Perhaps because of the ridicule that was heaped on his early mentor, Lowell, Dr. Slipher seems to be ultra-conservative about offering or even entertaining theories and making judgments. He has devoted himself to observation and measurement and allowed others to make what they will of the data. Where he might have given us an English-language counterpart of Antoniadi's great French areography of 1930, brought down through another generation, combined with something like Vaucouleurs' study, he has preferred to compile a family album. The book we have will undoubtedly be a classic, but it could have been far better.

THE MOUSE ON THE MOON
by Leonard Wibberley.
William Morrow & Co., New York. 1962. 191 pp. $3.95

I'm sure you haven't forgotten Grand Fenwick, the tiny principality jammed in between France and Switzerland that a few years ago won a war with the United States by invading New York with a company of bowmen during a civil defense alert and capturing our most secret weapon, the Q Bomb, and its inventor. "The Mouse That Roared," published in 1955, was a successful novel and an hilarious film that started Peter Sellers on his way to fame. There was apparently a second Grand Fenwick story in 1958, "Beware of the Mouse," but I missed it. Now the "Mouse" decides to beat the United States and Russia to the Moon—and does, with the aid of a war surplus U.S. rocket, a barrel of Grand Fenwick's great wine, Premier Grand Cru, and some iron filings.

The author's straight-faced slapstick humor should be familiar to most of you. The whole shenanigan starts because the Duchess Gloriana wants a fur coat and her Prime Minister wants bathtubs in the palace. The subsequent and consequent developments are quite logically implausible. However, I must object to the bobolinks that play an important part in the early portions of the story. American bobolinks would never turn up in Grand Fenwick, and if they did, would never, *never* nest in a beech tree or any kind of tree. Unknown elements and alcoholic propellents we can take in our stride—we've had even more outrageous things right here—but watch those bobolinks!

THEY WALKED LIKE MEN
by Clifford D. Simak.
Doubleday & Co., Garden City, N.Y. 1962. 234 pp. $3.95

The "they" of this original novel are an altogether protean lot of creatures out of somewhere-or-other who usually look like bowling balls and *can* look like anything at all. One of them transforms itself into a man-trap, set outside the door of science reporter Parker Graves. Why Graves is never really clear—at that stage he is certainly no trouble to the invaders. But maybe they're just getting rid of people who are apt to be.

At any rate, Graves and his faithful readers—us—are soon aware of as nice a situation as science fiction has seen for a long time. Someone is buying up the town, and closing it down. Stores, apartment houses, gas stations, motels—everything. Playing our own game by our own rules, someone is dispossessing mankind. (One can't help wondering what approach the critters use in the communist countries.) For, naturally, the "someones" are the aliens—the bowling balls—that can reshape themselves into people, things or practically any shape they choose, and in these various guises are acquiring a new world for their comfort and amusement.

The struggle promptly becomes physical, and here Graves is aided by a rather remarkable Dog, another alien, of whom we see altogether too little. He is also aided by a touch of the Simak "pastoralism" of which Kingsley Amis has written: There are unexpected allies in the Minnesota woods.

I don't know whether Minneapolis, Mr. Simak's home town, is going through the cycle of demolition that Pittsburgh and other cities are. Passing through parts of the city that I haven't seen for a year or so, there are acres of rubble where there were once stores and houses. Presumably new ones will be built to take their place—but will they? Who is really demolishing our civilization around our ears? Not bowling balls, perhaps—but how about Volkswagons? They throng into the empty spaces where the buildings once stood. They wander up and down the streets. They stand by the curbs, watching us at work and play. There are processions of them . . . throngs of them.

Up to now, though, they haven't walked like men. Or have they?

THE GREAT EXPLOSION
by Eric Frank Russell.
Torquil Books: Dodd, Mead & Co., New York. 1962. 187 pp. $3.50

Usually reliable sources—Circular No. 16 of the Futurian Society of Sydney, Australia—say that this is an amplification of "And Then There Were None," published here in 1951. The title refers to the explosion of the maverick elements of humanity throughout the galaxy, as soon as a faster-than-light drive is discovered. The story comes along four hundred years later, when Terra is trying to make contact with her scattered children and draw

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them gently but firmly back into the Terran Empire as a well-taxed bulwark against possible nonhuman rivals who may some day appear.

Minor episodes in the search made by one ship, with its mixed crew of space navy veterans, military, and bureaucrats, lead up to the longer and more exasperating adventure chronicled here as noted in Sydney. In all of them the humor tends to the broad and corny—"squad humor," they say Down Under—and the idiosyncrasies of the colonists rather obvious. First there is a prison colony which has split into scattered, mutually repelling polarized fragments, forever separated by their common philosophy of "why work?" Hygeia, on the other hand, was populated by nudists and physical-fitness nuts, who have intensified their distrust of Terra through the centuries.

Number three, Kassim, is the cream of them all. This is the happy, healthy, smoothly running world built on the anarchistic principles of obs, "Myob," and "I won't." Instead of money there is the exchange of "obs"—obligations. To undue questioning the stock answer is "Myob!"—"Mind your own business." And to force the Gands have an equally pat answer: "I won't." Need it be said that they were followers of Gandhi?

The infectiousness of the Gand society needs to be investigated to be fully enjoyed. Why don't you?

THE MAN IN THE HIGH CASTLE
by Philip K. Dick.
G. P. Putnam's Sons, New York.
1962. 239 pp. $3.95

This is a fascinating realistic story laid in a world in which President Roosevelt was assassinated in Florida, there was no pre-Pearl Harbor defense program and no lend-lease, Russia was crushed, and Europe and America were defeated. The Pacific Coast states, by 1960, have become a Japanese-dominated puppet much like the East Germany of our world. There is a similar Nazi-occupied satellite in the eastern United States, and a semi-independent buffer between the two, in the Rocky Mountain states. There also seems to be a southern satellite, though we hear little of it. Canada has maintained its independence; Bob Hope is up there, broadcasting impudent TV programs into the Nazi and Japanese satellites. The extermination of the Jews in Europe and German-occupied America has been followed by the extermination or enslavement of the Negro race in Africa and throughout the world. In Japanese America, however, society has been rebuilt on a more civilized basis.

The author has constructed this Japanese-based western society with loving care and minute attention to detail. To appreciate just how well he has done this, I am very much afraid one would have to be as thoroughly steeped in Zen and in the minutiae of real Japanese society as he seems to be. With a glimpse here and a vignette there, he manages to contrast life under the two regimes and suggest the Japanese-German tensions that amount to a counterpart of our own Cold War, with the difference that the United States is filling the role that Eastern Europe is in our continuum.

In a well-guarded castle near Cheyenne, in the nominally independent Rocky Mountain States, a writer named Hawthorne Abendsen has written an underground best-seller, "The Grasshopper Lies Heavy," in which Germany and Japan have lost the war—and a Nazi killer is on his trail. In the Pacific States of America, a Jewish craftsman, an American dealer in fake antiques, and a Japanese bureaucrat become ever more intricately entangled in a plot that centers on a visiting Swede and an old gentleman from Tokyo. And in and out of it all weave the cryptic prophecies of the *I Ching*, the ancient Chinese Book of Changes that dominates the lives of Japanese and conquered Americans alike.

I have a strong feeling that—like "The Grasshopper Lies Heavy"—this is a book that is going to have a kind of underground success and wind up as a classic without ever having been read by very many people. It is one that is going to bear rereading, too—not for what happens, though that is subtly and believably worked out—but for the way in which this alternate world has been created down to the last nuance. With no serialization or paperback edition in 1962, a book that deserves a crack at the Hugo for best novel may never be widely enough known to get into the finals. And the prohibition against hardback books as winners—Tucker's Law of Hugos, which was broken in 1962 by Heinlein's "Stranger in a Strange Land"—will go back in force.

TIME WAITS FOR WINTHROP AND FOUR OTHER SHORT NOVELS FROM GALAXY
edited by Frederik Pohl.
Doubleday & Co., Garden City, N.Y.
1962. 336 pp. $3.95

Unless I'm farther off-base than usual, all five of these *Galaxy* novelettes have been reprinted before in other anthologies and short-story collections, hard- or paperback.

Damon Knight's "Natural State" is the best of the lot. You'll remember it as the sometimes hilarious comedy of the actor sent out with a cargo of New York's export goods to make a market among the Muckfeet of the rural hinterland. But Alvah Gustad finds that the country simpletons aren't quite as simple as he'd been conditioned to believe.

Theodore Sturgeon's "To Marry Medusa" is, naturally, a unique experience. It is another of the author's explorations of *gestalt* psychology and philosophy—the concept that mentally, spiritually and psionically the whole is far greater than the sum of its parts. But the *gestalt* of mankind turns out to be something the galactic medusa had never experienced or imagined when it attempted a takeover.

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In "Galley Slave," Isaac Asimov is continuing with his positronic robot series and his probing for new ways to overthrow the Three Laws of Robotics without breaking them. In this case, Robot EZ-27, designed for proofreading and other academic jobs, nearly wrecks U.S. Robots.

"Accidental Flight," by F. L. Wallace, is a plot story about the near-immortal "accidentals," paraplegics and freaks who have been patched up by medical miracles and exiled to a planetoid that is as much prison as sanatarium. They want a chance to go to the stars, since their life-spans are long enough to make a round trip possible, and have to fight to get it.

Finally, the name piece by William Tenn is amusing in its portraiture of five types from our own time who are visiting a future that only one of them can stand. They must all return together, or none of them can go home—but Winthrop has never had it so good, and has no intention of going back. One by one they attempt to persuade or force him to give up.

We're getting paperbacks with more and better stories for a tenth the price.

UNWISE CHILD
by Randall Garrett.
Doubleday & Co., Garden City, N.Y. 1962. 215 pp. $3.50

Here is the diligent Mr. Garrett, no stranger to these pages under his own and various pen names, taking on Isaac Asimov in that gentleman's home grounds. "Unwise Child" is both a variation on Asimov's famous Three Laws of Robotics and a future detective story. On both levels it is good reading.

Not content with harassing Asimov, the belligerent Mr. Garrett has produced a hero—"Mike the Angel," formally M. R. Gabriel—who at times acts like a sober Gallagher out of the works of Henry Kuttner. And his robot, Snookums, is by all means the most attractive mechanical monster since "Forbidden Planet" hit the movie screens.

Mike the Angel, electronic genius and all-'round man, is encountered in the midst of a hassle with some well organized juvenile delinquents: some nice implications here of the kind that we have come to associate with Fritz Leiber. He is then summoned to the Antarctic to meet Snookums, the mobile data-collector of a super-computer which is to be exiled from Earthh because it has become too smart for safety. He also meets an enticing young lady, a robot psychologist whose attributes can be credited entirely to Randy Garrett, a field anthropologist of considerable experience.

In space, en route to the planet where Snookums is to be exiled, a third mystery develops and culminates in murder—an impossible murder, if Asimov's Three Laws still hold and Snookums has a built-in prohibition against harming any human being. Mike does tie up all the loose ends neatly in a final showdown, but not before Mr. Garrett has shown that he can (a) develop a whopping loophole in the Three Laws; (b) conceal important clues with as neat a piece of sleight-of-hand as anyone since Blackstone; (c) introduce a hero as competent as Gallagher and considerably more interesting as a person; (d) handle all this with a leavening of humor that is pure Garrett.

I hope that Mike the Angel has not gone into retirement.

THE WIZARD OF LINN
by A. E. Van Vogt.
Ace Books, New York. No. F-154. 1962. 190 pp. 40¢

This sequel to "Empire of the Atom"—Ace No. D-242—was serialized here in Astounding, beginning in April 1950. It is the last of the "Clane" series, about an empire of about 12,000 A.D., when science has become barely a memory and men fight with swords and bows and ride in spaceships. Lord Clane, the mutant offshoot of the ruling family, should have been destroyed at birth; now, in adulthood, the ruling House of Linn needs his brains. In the earlier stories he fought off a barbarian invasion and patched up an uneasy truce with the invaders, Czinczar and his horde. Now the Linnan Empire clashes with nonhuman attackers from among the stars, the Riss, at the same time that Clane's sister-in-law, Lillidel, has decided that Linn can do wtihout him.

These stories of the atom gods and the machinations of their people were among the more coherent of Van Vogt's later stories for Astounding. Plenty happened, but you could—and can—make sense of Clane and what he does. Except, that is, for the "true" nature of one seemingly simple yet powerful device, the restless silver sphere that Clane discovered in the pits of the atom gods and used first to defeat Czinczar. Read through to the explanation of what that is and how it works, and then try to imagine a physics or a cosmology in which it *could* work . . .

THE PHILOSOPHICAL CORPS
by E. B. Cole.
Gnome Press. Hicksville, N.Y. 1962. 187 pp. $3.00

The stories which have been woven together into this lively interstellar adventure novel of the far future appeared here beween 1951 and 1955. The book itself seems also to have had a complex publishing history, which will confuse collectors and bibliographers no end: it is copyright in 1961, has a Library of Congress card number dated in 1960, and was officially published September 15, 1962.

If your acquaintance with Analog/Astounding goes back eleven years, you may remember Fleet Commander Dalthos A-Riman and his crime-blocking unit in the Galactic Federation's Criminal Apprehension Corps. A-Riman, the "fighting philosopher," has some unorthodox ideas about the relationship between ethics and politics, and gets a chance to put them into practice. The results are never dull.

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In the initial episode, after A-Riman has his assignment, he has five men to find, somewhere on a distant planet, and ten days to do it in. They are "Drones," bored and resourceful, living in disguise among the natives and devoting their talents to stirring up trouble. His next, and tougher assignment is to take on a gang of "degraders," hard-nosed and ruthless businessmen who are brutally exploiting entire planets. The solution is likewise violent.

Episode three is a pleasant interlude, as two recruits for the Philosophical Corps begin their last test, finding their way into the Corps' hidden base without being detected. We then follow this pair, Lanka and Banasel, into the longest, trickiest and most interesting assignment in the book, on the track of another pair of badly aberrant drones who are totally lousing up an otherwise healthy planetary culture in the name of good dirty fun.

This is the kind of interplanetary action fiction that is simply good fun to read. We need more of it.

LATEST REPRINTS

TARZAN AND THE LOST EMPIRE
by Edgar Rice Burroughs.
Ace Books, New York.
No. F-169. 1962. 192 pp. 40¢

"Lost races" once played an important part in science fiction. Nowadays we know they're not there; thirty years ago we weren't so sure. Many of the Tarzan books deal with such hang-over societies, embedded somewhere in the African landscape. As they are reprinted, I'll list them here without a full-scale review—if you have no objections. This one, fourteenth in the Tarzan series, is Ace's first reprint and the first Tarzan title to participate in the current Burroughs revival. This time Tarzan finds a surviving outpost of the Roman Empire.

MISSION OF GRAVITY
by Hal Clement.
Pyramid Books, New York.
No. F-786. 1962. 174 pp. 40¢

One of the all-time classics, serialized here in 1953. Hal Clement has never surpassed his creation of the high-gravity world, Mesklin, with its strange people.

INVADERS OF EARTH
edited by Groff Conklin.
Grossett & Dunlap, New York. Tempo Books No. T-6. 1962. 382 pp. 50¢

Tempo Books are a new paperback series for teen-agers that promises to include some science fiction. This anthology, of course, was intended for adults when it first came out in 1952. Any Conklin anthology is good, and this is one of the better ones.

SPACE PRISON by Tom Goodwin.
Pyramid Books, New York.
No. F-774. 1962. 158 pp. 40¢

A new printing with new cover of the Gnome Press book titled "The Survivors," and previously reprinted by Pyramid in 1960. Survivors of a space battle are left to Ragnarok.

SOMETIME, NEVER
Ballantine Books, New York.
No. F-657. 1962. 185 pp. 50¢

A new edition of the original Ballantine papeback of 1957—hardcover only in England. It contains two science-fiction novelettes and one gothic yarn, Mervyn Peake's "Boy in Darkness" from his "Titus Groan" sequence. The SF items are William Golding's choice "Envoy Extraordinary"—an inventor ahead of his time in the late days of the Roman Empire—and John Wyndham's "Consider Her Ways," a nightmarish glimpse of a future in which Motherhood is ALL. The Golding story has been made into a play, "The Brass Butterfly."

GATHER, DARKNESS
by Fritz Leiber.
Berkley Medallion Books, New York.
No. F-679. 1962. 174 pp. 50¢

The original, well-remembered serial was here in 1943. The hardback edition came along in 1950. It's a classic, in which science, religion and witchcraft are inextricably mixed.

FIRST ON THE MOON
by Hugh Walters.
Grossett & Dunlap, New York. Tempo Books No. T-13. 1962. 192 pp. 50¢

This one *is* juvenile—third in the English series about Chris Godfrey, the English boy who races a Russian to the Moon and tangles there with an alien mystery-vapor.

THE MARS PROJECT
by Wernher von Braun.
University of Illinois, Urbana, Illinois. No. IB-2. 1962. 91 pp. 95¢

A paperback edition of van Braun's detailed prescription for sending a research fleet to Mars. A new introduction explains what changes current developments have made in the original plan.

THUVIA, MAID OF MARS
by Edgar Rice Burroughs.
Ace Books, New York.
No. F-168. 1962. 143 pp. 40¢

Like Dover, Ace has begun its reprints of Burroughs' Mars series with the fourth book. New cover by Krenkel.

THE MOON MEN
by Edgar Rice Burroughs.
Ace Books, New York.
No. F-159. 1962. 222 pp. 40¢

The last half of Burroughs' book, "The Moon Maid"—the first part was Ace No. F-157. Ace has pulled a cutie here, and reprinted the magazine versions of the two serials, "The Moon Man" and "The Red Hawk," that were later incorporated in the book. It should make this edition a collector's item.

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Which Stars Have Planets?

Continued from page 16

shown in Fig. 4 (p. 11). They are, called main sequence stars.

A study of the characteristics of main sequence stars shows that the hottest stars are the most luminous. Since luminosity depends on mass, and since fuel consumption varies as the fourth power of the mass, it can be concluded that the hottest, brightest stars have the shortest lifetimes of any on the main sequence.

A star that evolves away from the main sequence becomes a red giant or supergiant, and finally ends up as a white dwarf.

It is known that the process of leaving the main sequence while evolving into a red giant and then into a white dwarf results in the release of so much energy—all nova and supernova appear to lie between red giants and white dwarfs—that any life existing on its planets would be destroyed.

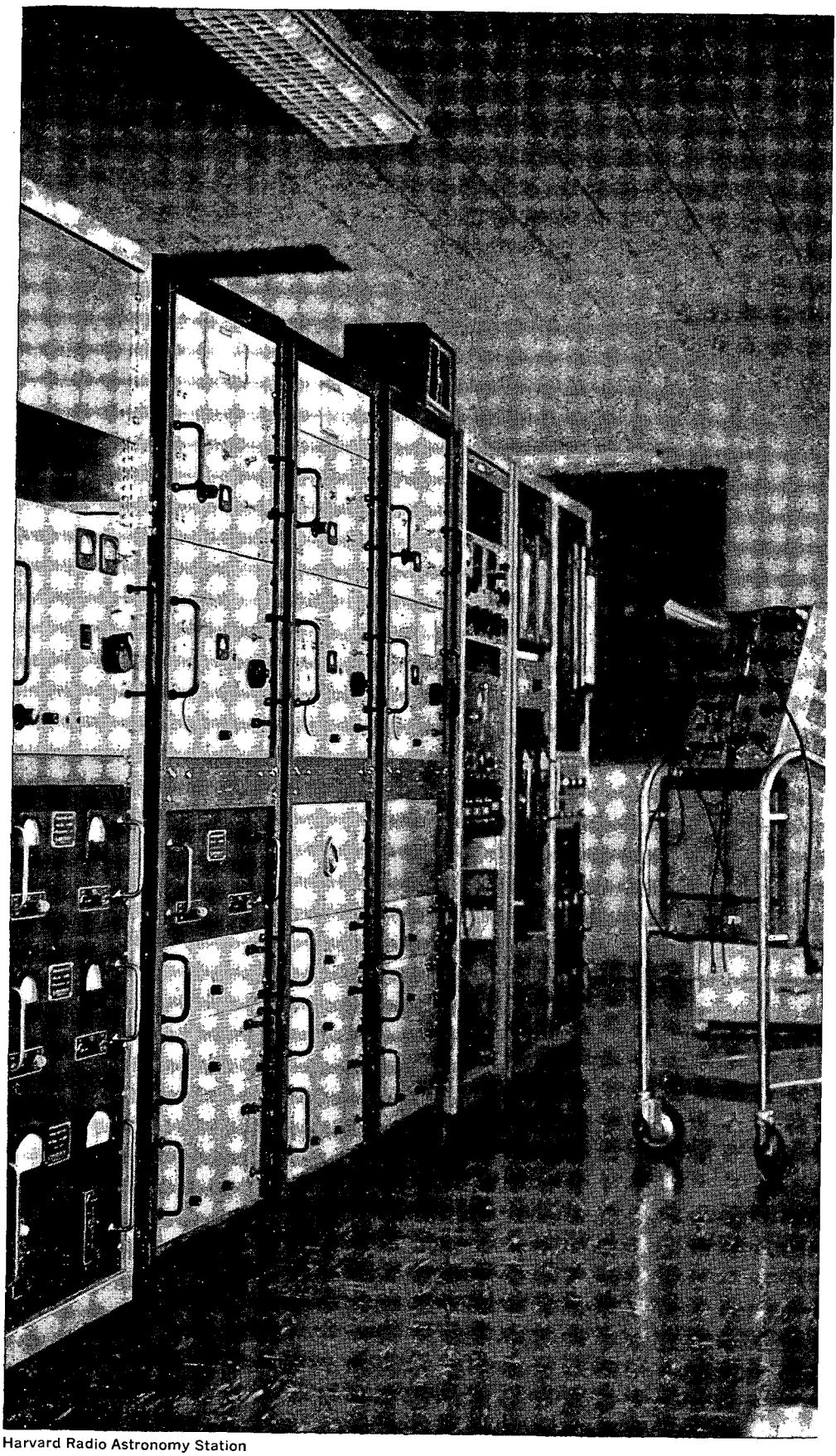
We can, therefore, conclude that only stars on the main sequence can have inhabitants who evolved from life forms which developed on that planet.

Since we are most interested in planets on which life developed, rather planets on which life, intelligent life, exists because it might have migrated there, we can next eliminate O and B stars on the main sequence because their lifetimes are relatively short, being of the order of fifty million years or under.

A-type stars are believed to last about three billion years before they leave the main sequence, and it is, therefore, unlikely that intelligent life would have evolved on any of these unless it occurred at a rate more rapid than here on earth.

We are left, therefore, with stars on the main sequence ranging from F to M as the ones about which there has been adequate time for advanced life forms to evolve.

The second condition necessary for life, the size of the habitable zone, reduces the possibilities of in-



Harvard Radio Astronomy Station

Fig. 11: And none of that equipment would help without ranks and banks of high-sensitivity, high-precision electronic analysis equipment.

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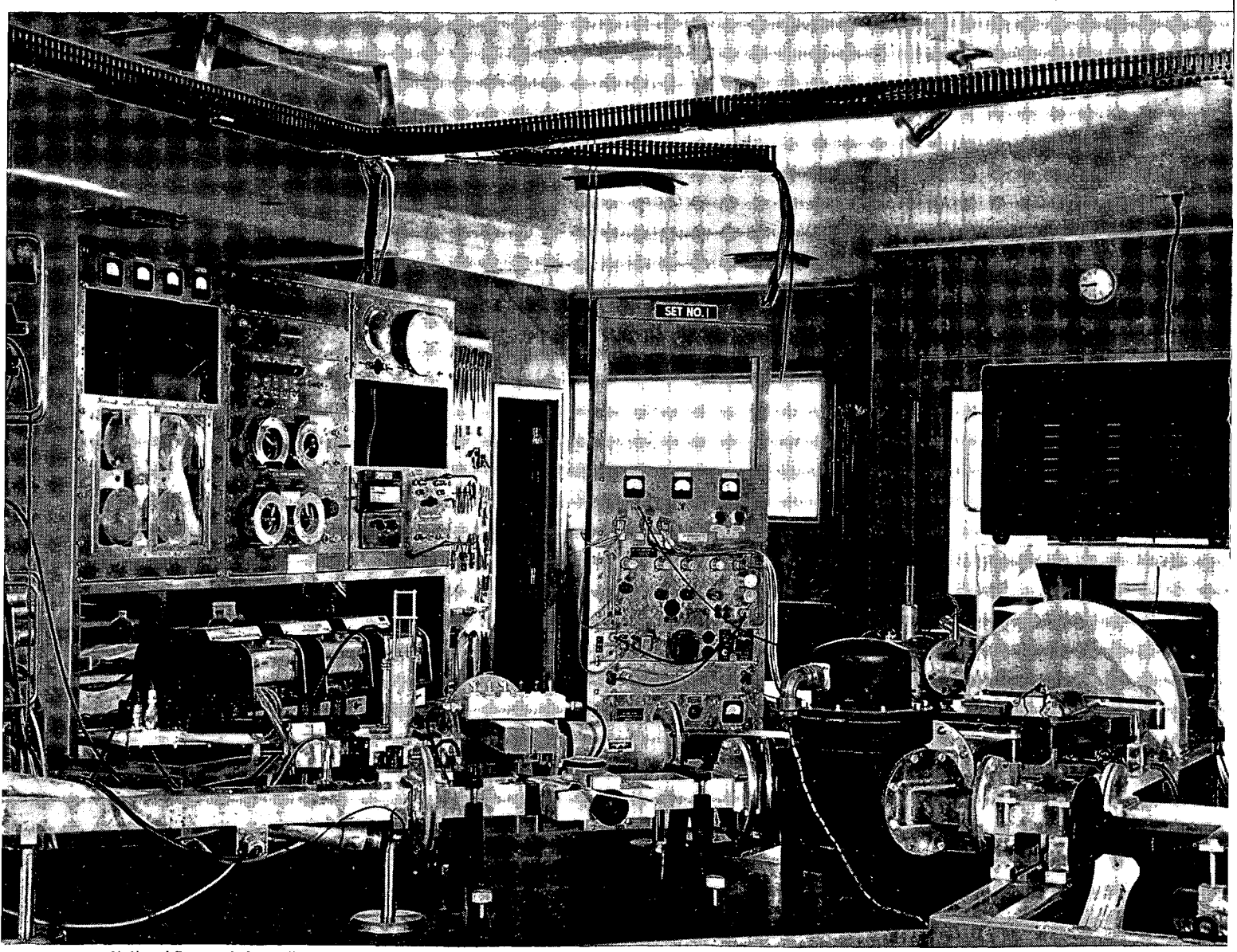
Fig. 12: Pictures of the looming radio-telescope dishes are familiar by now . . . but this is the business end of a radio telescope! The 10.7cm. "Solar Patrol" receiver of the Algonquin Radio Observatory, Lake Traverse, Ontario, operated by the National Research Council of Canada.



National Research Council of Canada

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habited planets orbiting the smaller K and M stars on the sequence. Although the lifetime of an M star can be tens of billions of years before it becomes a red giant, the chances of life springing up on a given K or M are not as good as for F, G, and some K star planets, because of the much smaller habitable zones associated with the smaller M stars as well as some of the K's. Although it is possible, the chances of a planetary orbit falling within the relatively small habitable zones of M and K stars are not very good. On the other hand, since there are a great many K and M stars the number of these with possible inhabited planets can certainly not be neglected.

We should point out, at this juncture, that, although we are in the process of eliminating large groups of stars from our study, we are doing so not because life cannot exist on their planets. Obviously, a search for stars which have inhabited planets must be limited to a relatively few stars, at least initially, and we are attempting to determine which stars are *most likely* to have inhabited planets.

Of the two hundred or so billion stars in our galaxy, roughly ten per cent belong to the group with which we are left, the F, G, and K0 to K4 group. This brings the total number of stars which can have planets on which life is most likely to occur to approximately twenty billion.

This number can be further reduced when we take planetary orbits into account.

The currently accepted theory of the origin of stars—that these were formed by the condensation of clouds of cosmic dust and gas—accounts more readily than any other theory for the formation of our solar system. It also accounts for the fact that a great many stars in our galaxy are binary, or multiple systems. It follows from the condensation theory that multiple star systems, as well as planetary systems surrounding stars, would be the rule, rather than the exception in the universe.

The presence of two or more stars in a single system can certainly be expected to significantly affect the orbit of any planets belonging to this sytem. It is unlikely that any planet orbiting within a complex star system will have an orbit that will remain within the habitable zone of one or of both stars at all times. This is not to say a stable orbit in a multiple star system isn't possible. Calculating orbits for multiple systems is hopelessly difficult except in a few cases. But for the purposes of this study we would prefer, once again, to stick to those stars which are rather high on the statistical ladder.

Since roughly half of the stars in the range from F0 to K4 belong to multiple systems, we are left with some ten billion stars for which all the necessary conditions for the evolution of life on planetary systems associated with them would be favorable.

Although we have eliminated ninety-five per cent of the stars in our galaxy, we are left with a substantial number to investigate. Where do we begin? We suggested earlier a study of the flare stars, particularly the cooler ones in the range from K0 to K4. The one drawback here is that there are no flare stars within the group that is closest to us.

Looking at our nearest neighbors we find that many of the conditions we have already laid down are not fulfilled by these. Alpha Centauri, the closest, is part of a triple system and it is very unlikely that a stable planetary orbit could be found within it.

After looking at our closest neighbors, it seems that the best possibility is offered by Tau Ceti, a G4 star. It is yellow, and slightly cooler and a little older than our sun, which is a G2. It is about eleven light-years away.

In order to determine whether Tau Ceti has a planetary system a program of monitoring should begin as soon as possible, with regular observations of the star made in the light of the H-alpha emission line to determine the extent to which it shows flare activity. In addition, X-ray emission, ultraviolet light intensity, and radio noise measurements should be made as part of a regular program.

The data, when plotted and analyzed, may very well give us the answers necessary to determine whether this star has a planetary system, and whether these are likely to support life, this being the case if they fall within Tau's habitable zone.

Once this has been determined, we can try to communicate. ■

"GOD PROTECT ME FROM MY FRIENDS . . ."

"Experience should teach us to be most on our guard to protect liberty when the Government's purposes are beneficent. Men born to freedom are naturally alert to repel invasion of their liberty by evil-minded rulers. The greatest dangers to liberty lurk in insidious encroachment by men of zeal, well-meaning but without understanding."

Mr. Justice Brandeis' dissenting opinion in Olmsted v. United States, 227 U.S. 438,479 (1928)

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BRASS TACKS

Continued from page 5

laws of motion that could give numerical answers to problems of moving bodies, be they cannon balls or stars.

This is why astrology fell into disrepute, I think. It simply is not as reliable a tool for prediction as physics. Of course, there are areas where the physical sciences fall short: meteorology—both terrestrial and interplanetary—is one of them. But this is the result of a lack of data, not a flaw in the sciences themselves. When enough quantitative evidence is amassed to allow a meaningful theory to be formulated, then meteorology will become as exact a science as any.

The role of astrology seems to be one of strictly empirical correlations of seemingly unrelated phenomena. A couple of planets happen to be in a certain portion of the sky, and radio blackouts occur on Earth. It's a rule-of-thumb, as you say, and evidently a useful one. But astrology stops there. The people who find out *why* this happens, and whether or not there is a connection, will not be astrologers.

Incidentally, there are a couple of reports in the 7th September 1962 issue of *Science* concerning the effect of the lunar synodic period on rainfall in the United States and Australia. There is apparently a strong correlation. So you see, the American Association for the Advancement of Science is not so anti-astrology after all.

BENJAMIN W. BOVA

■ *The long-time problem of science is that of abstracting, from an immense mass of data, the correlations that are useful—so far, we have engineering only—and then finding out why those correlations exist.*

Before that second step can be taken, however, that first recognition-of-useful-correlations must be made.

Kelper discovered the correlation between time and areas swept by a radius vector in planetary orbits; that was engineering-type "it works" data. Newton made the step to Science, with the laws of motion and gravity derived from Kepler's observational correlations.

Astrology is not Science—because it's never tried to explain why the observed correlations exist. When the earliest astrologers stated: "When Orion rises in the evening, the weather will become colder," they observed a useful correlation. It was millennia before the next step, to Science, followed, and we knew why the correlation existed.

My position now is: I am certain there are extremely important correlations in the field of astrology which still have not been accepted by scientists for serious analytical study—and equally certain that there are vast masses of completely cockeyed and invalid "correlations" accepted by astrologers, which have no useful correlation in fact.

My objection to much of current Science attitudes is the hidden-assumption insistence: "We already have all necessary basic laws; everything can be explained by manipulation of what we now know." This underlies your comment re meteorology; "But this is the result of lack of data, not a flaw in the sciences themselves."

A missing Law of Nature is not of the same order as missing data! Missing data suggests that we need numbers to plug into now-known formulas. Missing Laws of Nature suggest we need new formulas—and until those are derived, no quantity of numbers will do us any good.

I suggest that the workable correlations that underlie such work as the radio-blackout predictions, the Moon-rainfall correlations, et cetera, are clues to new Laws of Nature —not merely new members to plug into known formulas.

And that meteorology will remain a quasi-science of very limited value until those new laws are sought for and found.

My objection is Science's attitude that no new FUNDAMENTALS remain to be found; only new DATA to plug into the well-known fundamentals. That attitude inhibits search.

Dear Mr. Campbell:

The article by Mr. Goodavage and your interesting editorial in the September issue came vividly to mind when, quite by accident, I ran across these paragraphs in a book published in 1923:

"An attempt to predict weather conditions in India at even larger range and on a more interesting basis was made by the late Sir Norman Lockyer, through study of the fluctuating heat of the sun, associated with the well-known periodical variation of sunspot activity.

"This idea has been elaborated by Professor T. J. J. See, of Mare Island, whose very recent (1923) studies associate sunspot activity with the conjugations and oppositions of the planets Jupiter and Saturn. Professor See believes old astronomical data enable us, on this basis, to predict general weather conditions many years in advance. He foresees, for example, a very hot summer indeed, in the year 1961, and an even worse one in 2081."

(Henry Smith Williams, *The Story of Modern Science* (in ten Vols. New York, Funk & Wagnalls, 1923, Vol. I, p. 212.)

In August of 1961 record heats of 117 F. were recorded in Lewiston, Idaho, and in Ephrata, Washington. I heard rumors to the effect that other areas also experienced unusual heat. It would be interesting to check world-wide records. Also, someone might look up Professor See's original study.

Meanwhile I await October' weather with interest, to see how well it fulfills the Astro-forecast in the October Analog.

THOMAS C. SLATE

■ *My power bills for operating my home air-conditioners record the summer of 1961 as very, very hot!*

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Editorial

Continued from page 6

cultures of their own without external help.

In this discussion, we can take two fairly simple tests of "high level culture."

1. In a high-level culture, *men* make the laws, in *present* time. In a low-level culture, Tradition, ritual-taboo, rules, and men cannot change laws by an act of legislation. (In essence, they confuse physical law, which is beyond human control, with social laws, and consider them of the same immutable order.)
2. High-level culture permits the complexity of interpersonal relationships, and the flexibility required to organize city-states, and nations that cut across traditional tribal lines.

There's a third highly-interesting test that might be said to distinguish the "High-level A" from "High-level B" groups. The highest level cultures show a third characteristic; the development—or acceptance from outside—of an Ethical Religion. Basically, all human cultures have some form of religion—an acknowledgment of the existence of nonhuman forces greater than human will, but of the nature of will. The low-level cultures have religions in which the Gods and the Demons are simply wills doing as they please—wills to be placated or bribed. In the beginnings of high-level cultures, there is a Power Religion; the Gods and Demons are Powers, and their power is sought to achieve desired ends.

Only in the highest cultures are the Gods—or the God—seen as an essentially *ethical* entity, very closely associated with What Should Be, not with means to Get What I Want. That God is Righteousness, not Might alone.

Now two terms need straightening out and nailing down a little, so they aren't quite such free-floating semantic-noise terms. These are "materialistic" and "objective" vs. "spiritual values" and "subjective opinions." Fundamentally, the two sets of terms refer to the same pair of entities—but with reverse bias. If you like the idea, it's "objective"; if you don't, and want to banish, or at least denegate it, it's "mere materialistic." Or you like it and call it "spiritual value," or dislike it and call it "merely subjective opinion."

To say "While this culture achieved little in a materialistic sense, its spiritual values were extremely high," basically has precisely the same fact-content as "They didn't achieve much objectively, but had extremely complex subjective opinions."

So we can use the objective—and therefore uniformly observable!—data that the Negro people did not achieve the social organization needed to build and maintain city-states.

Now to knock down some hackneyed "everybody knows" arguments that tend to hide the existence of that remarkable and impenetrable Curtain of Darkness that shrouded Africa for six thousand years.

The No. 1 on that list is, of course, the pure-racist's simple—and simple-minded—answer "The Negroes were too stupid and lazy? They're inherently inferior!"

Invalid. The Ethiopians are of the same racial stock—and they achieved/learned high-level culture. Also, throughout recorded history there have been Negro princes and nobles in Egypt, Greece, Rome, and in the Islamic Empire. The Moors who took over Spain were of Negro stock—and it took several centuries of desperate battling to prove they were "inferior" enough to be dislodged.

The Negroes imported via slavery into this country promptly showed that they were able to learn and use high-level culture ways in considerable degree. (Naturally, not all of them were able to. The large prison establishments in every nation of the world testifies to the fact that not all members of any cultural group can live by the mechanisms of a high-level culture.)

There's plenty of purely objective factual evidence to show that the Negro gene pool was perfectly capable of either learning or developing a high-level culture . . . and that it didn't. Most conspicuously and remarkably didn't.

Excuse No. 2, frequently heard, is "You *can't* build a civilization in a tropical jungle."

Invalid on two counts. First, it's invalid in fact; the Mayans developed a high-level culture in the tropical rain-forests of the Yucatan peninsula—and if you check a climatological map of the world, you may get a slight surprise. Africa has far *less* tropical rain-forest area than the Americas, or than the Eurasian land-mass. The people who built Ankor Vat in the tropical rain-forests of Cambodia managed to do what "can't be done." The Javanese had a high-order culture—and orang-utans like the same general kind of climate gorillas and chimpanzees do.

More important, that statement is the purest of cockeyed propaganda. So somehow you got suckered into accepting that it made sense? That Africa had a tropical rain-forest climate, and that explained it all? Man, Africa's a *continent*, not a county! What's Africa's climate like? Like the Sahara? Like the Mountains of the Moon country? Like the Kenya highlands? The semiarid plains of the veldt? Or the beautiful, moderate-temperate climate of the Cape?

Friend, you've been a good little propaganda-sucker, if you accepted that "you can't build a civilization in a jungle" explanation of the Negro's failure to develop a high-level culture!

Another standard explanation is the very vague, and hard-to-pin-down-under-questioning explanation that "The Negroes didn't have

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the cultural opportunities . . ." or "Didn't have the opportunities . . ." without definition of what opportunities they didn't have.

It's invalid as an explanation. The Aztecs, Incas and Mayans had no assistance from outside—which seems to be what's meant by "opportunities" usually. And the ancient people, whoever they were, who first started the cultures of the Eurasian land-mass, obviously didn't have "opportunities" either. The fact that no one taught the Negro peoples still would not explain the lack of original invention of civilization. It's been invented again and again, by a dozen entirely independent peoples, all over the earth.

Then—the mystery!—why did a major branch of the human racial area to work with, and at least six thousand years of time, *not* achieve what a dozen other peoples, with far less areas sometimes, did achieve?

They had diversity of climate, a diversity of tribal genetic enclaves, a huge area, rich in resources of all kinds which they never learned to exploit.

Moreover, if "opportunities" means having someone around to teach you—as I pointed out, the Negro peoples were in direct contact with the high-level culture of Egypt throughout that span of some three hundred generations. We know for a fact that many intelligent and competent Negroes drifted North to the cities of Egypt, Greece and Rome; we can reasonably assume that some of the Negroes had a yearning to go back and see the old home-folks.

Why—how!—did the Curtain of Darkness succeed in stemming that leakage of knowledge so successfully that all recorded history never penetrated?

Not only did it wall out penetration of ideas from outside, it was equally effective in preventing origination of cultural ideas inside the continental area! It wasn't simply a Curtain of Darkness—it was a Volume of Darkness.

On their little islands, the Polynesian peoples weren't able to build cities; a city requires an extensive area of intense development, supported by a large area of organized agricultural development. You can't do that on an island the size of the Pacific islands the Polynesians developed. But the Polynesians developed highly organized communities, with excellent elected-representative limited-monarchial forms. They developed extremely sophisticated navigational technology, and various auxiliaries to successful long-distance navigation. (Their coconut-shell sextants were extremely ingenious; it was a Polynesian genius, not the famous Dr. Diesel, who first made practical application of the fire-starting possibilities of sudden extreme compression of air. They had piston-and-cylinder fire-makers carved of precisely fitting hardwood that would start even sea-dampened tinder glowing in a fraction of a second in an open canoe!) And, incidentally, many of them developed highly ethical religions.

Other peoples, elsewhere, with far less opportunity in the way of available resources, developed high-level cultures.

How did the Darkness effect maintain itself on Africa?

Alone of all the world's major peoples, the African Negroes somehow developed a technique of cultural stabilization so effective that not only did it prevent the Negroes themselves from achieving advancement—but it absorbed and destroyed any leakage of enlightenment from outside.

The beginnings of high-level African cultures came only when Europeans invaded, by force of arms, along the southern coastal areas.

Somehow, somewhere, the Africans must have developed some sociological mechanism that not only blocked inflow of learning, but actively absorbed and destroyed any that arose within the continent.

And that, my friends, is a highly important factor indeed, in this modern world!

We don't know what that sociological mechanism is—but it's a fair bet, under the circumstances, that it is still in operation, damping out, absorbing, knowledge in Africa today. Still fighting the enlightenment of education, of high-level cultural concepts as it did with such incredible success for six thousand years *minimum*—for that is merely the span of *written* history. And civilization had to be already very well advanced before writing became possible.

There are areas in the world where people would be most happy indeed to learn of the mechanism of such an effective information-damper! They'd like to have it to modify to their own uses.

We'd like to know what it is, because Africa will be held back for generations if that Darkness mechanism is not directly attacked—and there's reason to believe that it's got some kind of self-repairing, self-regenerating mechanism about it, or it would have worn out by sheer attrition in those millennia.

It's of interest to science-fictioneers, because it suggests that there is some kind of sociological mechanism whereby a race fully capable of high-level cultural development can be internally suppressed and retarded for enormous spans of time. It may be that a planet capable of supporting life will, automatically, be quickened to life. But Africa's Negro people show that a race capable of civilization, and with every resource needed for development of civilization, may establish a sociological mechanism of some sort that renders civilization impossible.

The mystery is . . . what is it?

The Editor.

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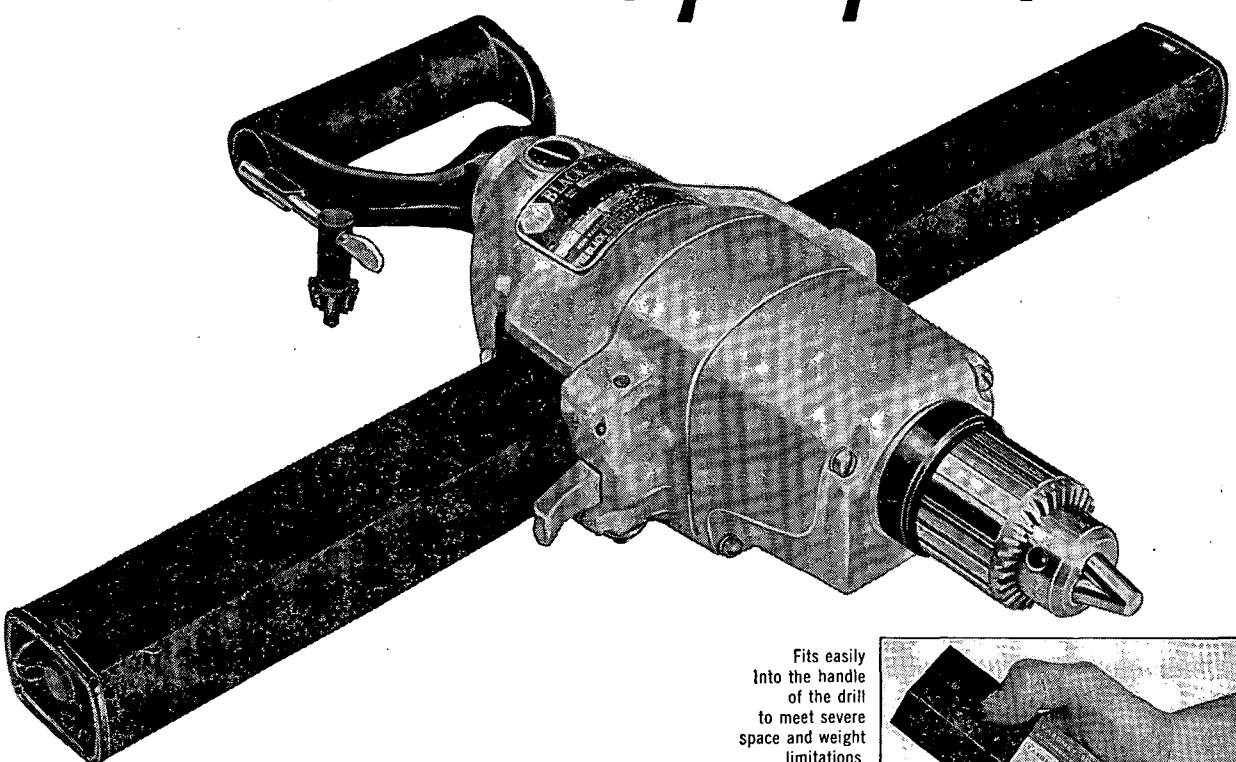

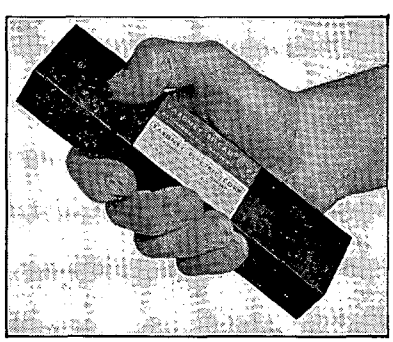

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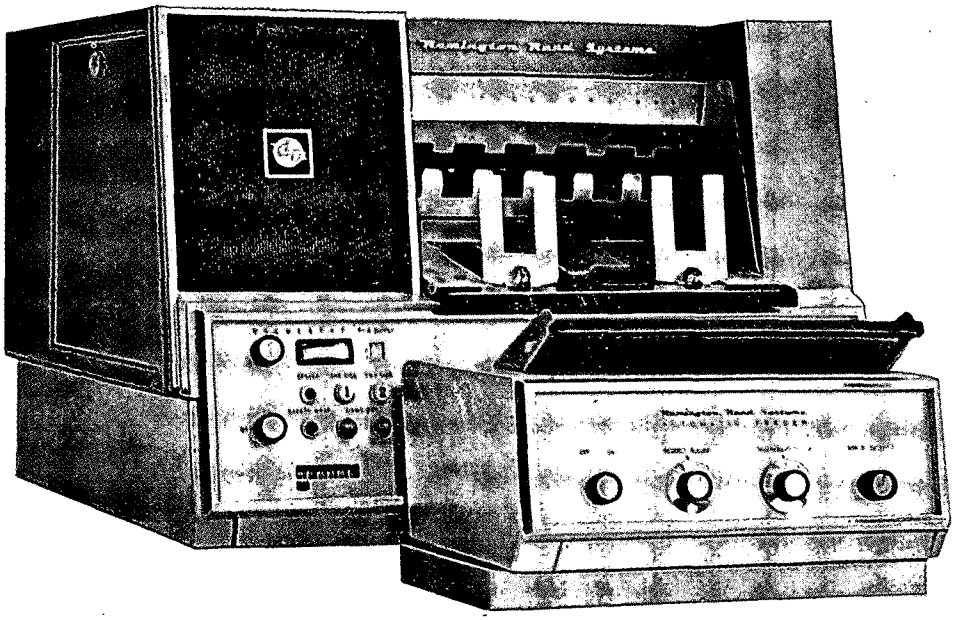

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